

August 23, 1996

MEMORANDUM

TO: Orville D. Green, Assistant Administrator
Permits and Enforcement

FROM: Brian R. Monson, Chief *Bm*
Operating Permits Bureau

SUBJECT: Issuance of Tier II Operating Permit #001-00112
to Sinclair Oil Corporation (Boise)

PURPOSE

The purpose of this memorandum is to satisfy the requirements of IDAPA 16.01.01 Sections 400 through 406 of the Rules for the Control of Air Pollution in Idaho (Rules) for issuing Operating Permits.

PROJECT DESCRIPTION

This project is for the issuance of a Tier II Operating Permit (OP) for the Sinclair Oil Corporation (Sinclair) facility, located in Boise, Idaho, in order to establish the facility as a synthetic minor source for hazardous air pollutants (HAPs) and volatile organic compounds (VOCs). As a synthetic minor source of HAPs, the facility will be considered an "area source" for the Bulk Gasoline Distribution MACT standard. Emission sources existing at the facility are as follows: five (5) storage tanks capable of storing gasoline or distillate fuel oil grade petroleum product, three (3) storage tanks to store distillate fuel oil grade petroleum product, one (1) prover tank to verify product shipping and receipt quantities, one (1) storage tank for residual tank and process waste, one (1) double bay submerged top fill loading rack, and process piping fugitive emission sources.

SUMMARY OF EVENTS

On September 12, 1995, DEQ received an application for a Tier II OP. This application was declared administratively complete on October 12, 1995. Additional information was received on November 29, 1995, and on January 10, 1996. On February 13, 1996, a proposed Tier II OP was issued for public comment. A public comment period was then held from February 23, 1996, to March 25, 1996.

On March 19, 1996, and March 21, 1996, DEQ received comments about the content of the proposed OP. These comments were addressed by DEQ in the response package and incorporated into the final operating permit.

On April 29, 1996, DEQ received a formal request for a stay of permit issuance, which was honored. On June 17, 1996, DEQ received a submittal from Sinclair requesting revisions to the original proposed Tier II OP.

RECOMMENDATIONS

Based on the review of the Tier II OP application, additional supporting information submittals, and applicable state and federal regulations concerning the permitting of air pollution sources, the Bureau staff recommends that Sinclair Oil Corporation, in Boise, be issued a Tier II OP. The facility has already submitted the permit application fee of \$500.00 as required by IDAPA 16.01.01.470 of the Rules. Fees pursuant to IDAPA 16.01.01.525 of the Rules will not apply upon permit issuance because the facility will be a non-major source of VOCs.

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cc: J. Palmer, SWIRO
Source File
OP File Manual
COF

August 23, 1996

MEMORANDUM

TO: Brian R. Monson, Chief
Operating Permits Bureau
Permits and Enforcement

FROM: Darrin A. Mehr, Air Quality Engineer *DA*
Operating Permits Bureau
Wade C. Woolery, Air Quality Engineer *W*
Technical Services Bureau

THROUGH: Susan J. Richards, Air Quality Permits Manager *SJR*
Operating Permits Bureau

SUBJECT: Supplemental Technical Analysis for Tier II Operating Permit (#001-00112)
Sinclair Oil Corporation (Boise)

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 16.01.01 Sections 400 through 406 of the Rules for the Control of Air Pollution in Idaho (Rules) for issuing Operating Permits.

This memorandum documents the changes in the Tier II Operating Permit's (OP) after the close of the public comment period and revised DEQ policy for issuing permits.

FACILITY DESCRIPTION

Sinclair Oil Corporation's (Sinclair) Boise, Idaho, facility distributes petroleum products received through the Chevron supply pipeline originating in Salt Lake City, Utah. Petroleum products consisting of various grades of gasoline and distillate fuel oil are temporarily stored in tanks prior to transfer to mobile carrier tanks for transport and delivery off-site.

Petroleum products consisting of various grades of distillate fuel oil and gasoline are received by the facility through a pipeline. The petroleum products are stored in any of eight (8) existing storage tanks. Gasoline is allowed to be stored in five of these tanks, and fuel oil can be stored in any of the eight (8) existing tanks. A "prover" tank is used for flow calibration, and a "trans-mix" tank is used to store "slop oil." The petroleum products are transferred from the tanks to the carrier by the loading rack system, prior to off-site transport and delivery.

Storage tanks #401, 404, 411, 421, and 431 are capable of storing any grade of distillate fuel oil as well as gasoline. Storage tanks #402, 405, and 406 can store any grade of distillate fuel oil, but not gasoline.

The carrier is situated in one of the two (2) loading rack bays where one or more loading rack arms are inserted through the fill hatch(es) in the top of the carrier tank. Either a gasoline or a distillate fuel oil product is transferred from the storage tank to the loading rack system, which delivers the product to the carrier tank. Additives may be blended with the gasoline or distillate fuel oil product during loading of the carrier tank.

Fugitive VOC and HAP emissions occur from process equipment including valves, pump seals, flanges, open-end connections, and process drains.

PROJECT DESCRIPTION

This project is for the development of an OP that will create state and federally enforceable limitations on the facility's potential to emit hazardous air pollutants (HAPs), and volatile organic compounds (VOCs). This permit would make the Boise facility a synthetic minor for both HAP and VOC emissions. A synthetic minor HAP source is referred to as an "area source" within the Maximum Achievable Control Technology (MACT) standards. Bulk gasoline distributors recognized as area sources of HAPs avoid the stringent control technology installation requirements of that MACT standard. Issuance of the permit limits VOC emissions below the 100 ton per year (T/yr) major facility threshold. Therefore, this facility will not be subject to Tier I permitting, pollutant registration, and registration fee payments for major facilities.

Refer to the technical memorandum dated February 13, 1996, (Mehr and Woolery through Richards to Monson) for a description of the sources present at the facility.

SUMMARY OF EVENTS

On September 12, 1995, the Division of Environmental Quality (DEQ) received an application for a Tier II OP. This application was declared administratively complete on October 12, 1995. Additional information was received on November 29, 1995, and on January 10, 1996. On February 13, 1996, a proposed Tier II OP was issued for public comment. The public comment period started February 23, 1996, and ended on March 25, 1996.

On April 29, 1996, DEQ received a formal request from Sinclair to hold issuance of the Tier II OP. This request was honored by DEQ, and permit issuance was stayed. On June 17, 1996, DEQ received a submittal from Sinclair containing a request for revisions to the original permit.

DISCUSSION

1. Emission Estimates

Emission estimates were originally provided by Sinclair in the September 12, 1995 submittal. Additional supporting calculations and documentation were included in the November 29, 1995, and January 10, 1996, submittals.

The product throughputs for gasoline and distillate fuel oil at the loading rack were altered by Sinclair in the June 17, 1996, submittal. Gasoline throughputs were further discussed with Sinclair to develop an operating scenario to provide maximum operational flexibility. The distillate fuel oil throughputs remained as Sinclair listed in the June 17, 1996, submittal. Annual gasoline throughput was backcalculated using a facility-wide VOC emissions cap of ninety (90) T/yr, resulting in an allowable annual loading rack throughput of 25,500,000 gallons.

Loading Rack Product	Proposed Permit Throughput (U.S. gallons per year)	Revised Throughput (U.S. gallons per year)
Gasoline	233,016,000	25,500,000
Distillate Fuel Oil	337,260,000	570,276,000

Due to the number and nature of assumptions incorporated into the allowable emissions analysis, Sinclair agreed to an annual VOC emissions cap of approximately ninety (90) tons per year (T/yr). Gasoline with an RVP of 11 psia more closely represents the allowable annual average of 10.9 psia, and provides worst case annual average VOC emission estimates. Therefore, RVP 11 gasoline physical properties will be used for the final Boise facility OP (refer to the February 13, 1996, technical memorandum (Mehr and Woolery through Richards to Monson), for a comparison of the different gasoline RVP cases.

Physical properties for RVP 11 gasoline were not incorporated for the Transmix, Prover and #431 tanks. Emission estimates for the storage tanks did not vary greatly when comparing emissions for RVP 11 versus RVP 10 gasoline.

Emission Estimates Conclusions

Daily throughput limits as listed in the February 13, 1996, technical memorandum will not be incorporated. Hourly emission limits were developed using the rated capacity of the emissions units/processes and the methodology is the same as for the Burley facility's June 17, 1996, submittal. The goal of the Tier II permit was intended to limit only the annual emissions of pollutants. No ambient air quality impacts were assessed for the facility, as the Permittee has stated all emissions units covered in the permit qualify as grandfathered sources, and this project is not for a modification.

Facility-wide annual potential emissions are:

POLLUTANT	POTENTIAL EMISSIONS (Tons per year)
Volatile Organic Compounds (VOCs)	89.95
Aggregated Hazardous Air Pollutants (HAPs)	2.54
Individual HAPs: Benzene	0.44
Ethylbenzene	0.063
Hexane	0.69
Naphthalene	0.0051
Toluene	0.74
Trimethylpentane 2,2,4 (Iso-Octane)	0.17
Xylenes (meta-, ortho-, and para-)	0.43

Appendix A of the proposed Tier II OP originally contained individual HAP emission limits for hexane and toluene to demonstrate that the ten (10) T/yr major source threshold for single HAP emissions were not encroached upon. Hexane and toluene were the largest single HAP emissions in comparison to the other HAPs inventoried. These limits have been dropped from Appendix A of the final permit because the emission levels have been drastically reduced, and an aggregated HAPs emission limit will suffice.

Revisions to Proposed Permit Due to Supplemental DEQ Review

Equipment and emissions control devices and methods listed in the permit originally issued for public comment have been removed in accordance with current Department permitting methods. These items are listed here to document the existing sources and provide a basis for determining the facility's potential emissions.

The following section contains the information deleted from the proposed Tier II OP.

Storage Tanks

Tanks #401, #404, #421, and #431 are allowed to store either gasoline or any grade of distillate fuel oil. Tanks #401, #404, #411, and #421 are sixty (60) feet in diameter and each has a storage capacity of 839,400 gallons. Tank #431 is 110 feet in diameter and has a storage capacity of 3,336,800 gallons. VOC and HAP emissions are controlled by an external floating roof.

Tanks #402, #405, and #406 are allowed to only store any grade of distillate fuel oil, and each tank is sixty (60) feet in diameter and has a storage capacity of 839,800 gallons. These tanks have a fixed roof, and VOC and HAP emissions are uncontrolled.

Additional tanks at the facility include the Trans-mix and Prover tanks. Each of these tanks has a fixed roof, and emissions are uncontrolled. The proposed Tier II OP contained VOC and HAP emission limits on the Trans-mix tank. No monitoring of product throughput was to be required for this source because an undetermined amount of total throughput is water and other process wastes. Emission estimates for the Trans-mix tank are:

- VOCs: 0.05 lb/hr and 0.21 T/yr
- Aggregated HAPs: 0.001 lb/hr and 0.005 T/yr

Loading Rack

The loading rack has two (2) bays. Carrier tanks are filled using one or more dispensing arms into fill hatches at the top of the tank. Petroleum products are transferred from storage tanks to carrier tanks using a submerged fill method.

Fugitives

Fugitive VOCs and HAPs are emitted from equipment at the facility. Fugitive VOC emissions were estimated to be 0.25 lb/hr and 1.07 T/yr. Fugitive aggregated HAP emissions were estimated to be 0.023 lb/hr and 0.121 T/yr. The documentation of emission factors is contained in the February 13, 1996, proposed Tier II OP's technical memorandum.

The following equipment was included in the analysis:

Gasoline Service

Pump Seals:	7
Valves:	103
Flanges:	230
Process Drains:	1
Oil/Water Separator:	0

Distillate Fuel Oil Service

Pump Seals:	4
Valves:	103
Flanges:	145
Process Drains:	0
Oil/Water Separator:	0

Summary of Changes Made to Proposed Permit

- Allowable distillate fuel product throughput increased, and gasoline decreased at loading rack.
- Allowable loading rack VOC and HAP emissions decreased by reduction of the gasoline throughputs.
- Individual HAPs emission limits removed from Appendix A of the OP.

Monitoring Requirements

Monitoring requirements for the purpose of demonstrating compliance with the annual emissions limits for the facility will consist only of monitoring of the type of product (gasoline or distillate fuel oil) and the number of gallons of each substance transferred from the supply pipeline to the storage tanks, and the amount in gallons transferred for off-site delivery through the loading rack. The product information must be monitored and recorded contemporaneously as the products are received and transferred to storage tanks, and as the products are transferred through the loading rack to off-site delivery vehicles. There are no specific daily throughput restrictions at either the loading racks or the storage tanks. Rather, the short-term emission limits are based upon the hourly capacity of equipment and the physical properties of the petroleum products. There is no feasible method for Sinclair to document compliance with the short-term emission limits. The variability in gasoline volatility, as well as seasonal temperature and throughput variations, lends itself to verification that the annual emissions limits are complied with by the facility.

For this reason, the facility will be required to monitor and record the product throughputs contemporaneously with the transfer to storage tanks and from the loading rack. This information is to be compiled on a monthly basis, and the monthly throughput totals will be compared to the twelve (12) month allowable product throughputs. Compliance will be determined on a twelve (12) month rolling summation basis, thus providing a method for determining compliance with the OP's allowable emissions for any twelve (12) month period (established after the first twelve (12) month period). This method of compliance demonstration should not place undue burdens on Sinclair, as the amounts of product received and transferred are already monitored for internal inventorying purposes.

Sinclair will not be required to monitor the Reid Vapor Pressure and individual HAPs for this permit, because the applicant and the Department have not utilized a variable RVP and HAP content approach in developing the permit emission limits. More stringent monitoring requirements are not necessary because the ninety (90) T/yr facility-wide emissions cap provides a level of confidence that the cap will not be exceeded, as long as the Permittee abides by the annual throughput restrictions.

The semi-annual reporting requirement (established due to public comment) has been retained in the final OP.

2. Modeling

No modeling was performed to assess the ambient air quality impacts of this facility.

3. Area Classification

Sinclair's Boise facility is located within the Northern Ada County Nonattainment Area, which is designated as a "moderate" nonattainment area for particulate matter with a mean aerodynamic diameter of ten (10) microns or less (PM₁₀) and carbon monoxide (CO). This area is designated as either in attainment or unclassifiable for all other criteria air pollutants (NO_x, SO_x, and VOCs).

The facility is located AQCR 64, Zone 11.

4. Facility Classification

The facility is not a designated facility as defined by IDAPA 16.01.01.006.25 of the Rules. (Petroleum storage capacity of the facility is approximately 5.834 million gallons. Designated facility threshold is 12.6 million gallons storage capacity).

The facility is classified as an A2 source due to permitted VOC emission limits below 100 T/yr, and permitted HAP emissions below ten (10) T/yr single HAP and twenty-five (25) T/yr aggregated HAP major source thresholds.

5. Regulatory Review

This Tier II OP is subject to the following regulatory requirements:

a.	<u>IDAPA 16.01.01.006 & 7</u>	Definitions
b.	<u>IDAPA 16.01.01.401</u>	Tier II Operating Permit
c.	<u>IDAPA 16.01.01.403</u>	Permit Requirements for Tier II Sources
d.	<u>IDAPA 16.01.01.404.01</u>	Opportunity for Public Comment
e.	<u>IDAPA 16.01.01.404.01(c)(v)</u>	Consideration of Comments and Final Action
f.	<u>IDAPA 16.01.01.404.04</u>	Authority to Revise or Renew Operating Permits
g.	<u>IDAPA 16.01.01.406</u>	Obligation to Comply
h.	<u>IDAPA 16.01.01.470</u>	Permit Application Fees for Tier II Permits
i.	<u>IDAPA 16.01.01.650</u>	General Rules for the Control of Fugitive Dust
j.	<u>IDAPA 16.01.01.728</u>	Sulfur Content Limit for Distillate Fuel Oil
k.	<u>Section 37-2506, Idaho Code</u>	Quality Standards for Motor Gasoline and Distillate Fuel Oil-Specifications Set By American Society of Testing and Materials
l.	<u>40 CFR Part 80.27</u>	Controls and Prohibition on Gasoline Volatility

FEES

Fees apply to this facility in accordance with IDAPA 16.01.01.470 of the Rules. The facility is subject to permit application fees for Tier II permits in the amount of five hundred dollars (\$500.00). Sinclair has already submitted this payment to DEQ with the application. With the issuance of this permit, Sinclair's Boise facility will no longer be subject to registration fees for major facilities, required by IDAPA 16.01.01.525 of the Rules.

RECOMMENDATIONS

Based on the review of the Tier II OP application materials and of applicable State of Idaho and federal regulations concerning the permitting of air pollution sources, the Bureau staff recommends that Sinclair Oil Corporation, in Boise, Idaho, be issued a Tier II OP for the sources that exist at the facility. An additional opportunity for public comment on the air quality aspects of the permit is not required. All memoranda for the project shall be provided to the public and facility for this final action.

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cc: J. Palmer, SWIRO
Source File

COF

Attachment A

Revised Emission Estimation Spreadsheet

Project Engineer: DM
Company Name: Sinclair Oil Corp.
Location: Boise, Idaho
Date Created: January 4, 1996
Today's Date: 07/23/96

90 TON/YR ALLOWABLE VOCs CAP

THIS SPREADSHEET IS MODIFIED TO REFLECT THE REVISED LOADING RACK THROUGHPUTS from SINCLAIR OIL CORPORATION from "Submittal of Revised Allowable Emissions" letter received on June 17, 1996 (Samuel B. Greene, P.E. to Orville D. Green) and maximum flexibility.

CHANGES: Loading Rack Fuel Throughputs: Gasoline Decreased to 25,500,000 gallons per year
Distillate Fuel Oil Increased to 570,276,000 gallons per year

BOISE, IDAHO FACILITY RVP 11 Gasoline CASE
Calculation of Loading Rack Emissions

ASSUMPTIONS

1. TANKS2.0 provides the monthly average true vapor pressure of the gasoline product AND the molar fraction of HAP constituents in the vapor phase of the gasoline product.
2. Trimethylpentane 2,2,4 is also known as Iso-octane.
3. Discussions with EPA Region X and the resulting discussions between EPA Region X and Research Triangle Park reveal that gasoline emissions of the three Xylene isomers should be aggregated under a heading of Xylene (mixtures).
4. The most vital assumption made with this analysis is that it assumes an identical chemical composition throughout the year. The most accurate method for estimating all emissions would be to have samples of gasoline chemical composition for EACH of the different Reid Vapor Pressure (RVP) categories. RVP is determined by chemical composition physical properties. Therefore, the acceptance of a single gasoline chemical composition is an important assumption. The applicant has further stated that this information would be difficult, if not impossible, to deliver because they may receive gasoline product from refineries other than their own corporation's.
5. Worst case HAP emissions occur for a constant RVP 10 psia gasoline product. However, the overall goal of the Boise facility has changed. VOCs and HAPs must both be limited below major source applicability thresholds. RVP 11 is the worst case for estimating VOC emissions. VOCs will be the pollutant that are closest to the major source threshold. RVP 11 will be used to establish permit allowable emissions for the loading rack. Emissions for storage tanks do not increase significantly when RVP 10 and RVP 11 emissions are compared. Note that only the information for Tanks 401, 404, 411, and 421 were altered to reflect gasoline with an RVP of 11 psia.

ANNUAL LOADING RACK EMISSIONS using an ANNUAL AVERAGE MOLE FRACTION GASOLINE SERVICE

L = 12.46 SPM/T

where L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure of liquid delivered, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute bulk liquid temperature, °R

L = see Chart
S = see 1.00
P = 3.54
M = 65.16
T = 511.1

ANNUAL Gasoline Throughput, gallons per year =

ANNUAL RVP 11 FOR ALLOWABLES

HAPs Compounds	Mole Fraction	L (lb/10 gal)	Emissions (Ton/YEAR)
Benzene	0.0051	0.0287	0.3655
Ethylbenzene	0.0005	0.0028	0.0358
Hexane	0.0081	0.0455	0.5805
Naphthalene	0.0000	3.35E-06	0.0000
Toluene	0.0072	0.0405	0.5160
Trimethylpentane (2,2,4)	0.0019	0.0107	0.1362
Xylene-m	0.0013	0.0073	0.0932
Xylene-o	0.0005	0.0028	0.0358
Xylene-p	0.0010	0.0056	0.0717
Gasoline (RVP-11)	0.9745	5.4778	69.8436

These vapor mole fractions represent Gasoline RVP 11 at Boise conditions
An annual average of 10.9 psia is the allowable RVP as set by ASTM D-4814-95a
ASTM D-4814-95a is the applicable standard for all bulk gasoline distributors for
the Reid Vapor Pressure of gasoline distributed within the State of Idaho.

XYLENE (mixture)
0.2007 tons per year

TOTAL 71.6784
TOTAL-HAPS ONLY 1.8348

DISTILLATE FUEL OIL SERVICE

L = 12.46 SPM/T

where L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure of liquid delivered, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute bulk liquid temperature, °R

L = see Chart
S = see 1.00
P = 0.0053
M = 129.04
T = 511.1

ANNUAL Distillate Fuel Oil Throughput, gallons per year =

ANNUAL

HAPs Compounds	Mole Fraction	L (lb/10 gal)	Emissions (Ton/YEAR)
Naphthalene	0.0005	8.34E-06	0.0024
Toluene	0.0102	0.0002	0.0485
Xylene-m	0.0115	0.0002	0.0547
Xylene-o	0.0031	0.0001	0.0147
Xylene-p	0.0000	0.0000	0.0000
Distillate Fuel Oil #2	0.9747	0.0183	4.6335
TOTAL	1.0000		4.7538
TOTAL-HAPS ONLY			0.1203

XYLENE (mixture)
0.0694 tons per year

570276.0 E^3 gallons

TYPICAL STORAGE TANK EMISSIONS

Emissions are estimated using TANKS2 and are for a SINGLE storage tank, except as noted.

Storage tank emissions are comprised of: Withdrawal, roof-fitting, rim-seal, and standing losses.

Gasoline Storage Tanks

RVP 11 Gasoline

Tanks 401, 404, 411, 421

HAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Benzene	0.0030	0.0131
Ethylbenzene	0.0007	0.0030
Hexane	0.0045	0.0198
Naphthalene	0.0000	0.0001
Toluene	0.0057	0.0250
Trimethylpentane (2,2,4)	0.0013	0.0056
Xylene-m	0.0016	0.0069
Xylene-o	0.0010	0.0044
Xylene-p	0.0014	0.0062
Gasoline (RVP-11)	0.4639	2.0320
TOTAL VOCs	0.483	2.1160
TOTAL-HAPS ONLY	0.019	0.0840

For the four (4) Tanks:

TOTAL VOCs	1.932	8.4641
TOTAL-HAPS ONLY	0.077	0.3361

Tank 431

HAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Benzene	0.0028	0.0124
Ethylbenzene	0.0005	0.0021
Hexane	0.0044	0.0192
Naphthalene	0.0000	0.0001
Toluene	0.0048	0.0212
Trimethylpentan	0.0011	0.0050
Xylene-m	0.0012	0.0051
Xylene-o	0.0007	0.0030
Xylene-p	0.0010	0.0044
Gasoline (RVP-	0.4614	2.0208
TOTAL VOCs	0.4779	2.0933
TOTAL-HAPS	0.0166	0.0725

Note: The use of Gasoline RVP 11 versus RVP 10 results in a negligible change in emissions. Therefore TANKS 2.0 will not be reinvestigated for Tanks 431, Transmix and Prover.

Tanks Transmix and Prover

Emissions are nearly identical (per applicant's submittal) to each other so the Transmix Tank results will be used for both tanks.

HAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Benzene	0.0003	0.0012
Ethylbenzene	0.0000	0.0001
Hexane	0.0004	0.0019
Naphthalene	0.0000	0.0000
Toluene	0.0001	0.0003
Trimethylpentane (2,2,4)	0.0001	0.0005
Xylene-m	0.0001	0.0003
Xylene-o	0.0000	0.0001
Xylene-p	0.0001	0.0002
Gasoline (RVP-10)	0.0478	0.2093
TOTAL VOCs	0.0488	0.2139
TOTAL-HAPS ONLY	0.0011	0.0047

For the two (2) Tanks:

TOTAL VOCs	0.0977	0.4279
TOTAL-HAPS ONLY	0.0021	0.0094

DISTILLATE FUEL OIL STORAGE TANKS

TANKS 402, 405, 408

HAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Naphthalene	0.0001	0.0003
Toluene	0.0011	0.0049
Xylene-m	0.0013	0.0057
Xylene-o	0.0004	0.0015
Distillate Fuel Oil #2	0.1085	0.4752
TOTAL VOCs	0.1113	0.4876
TOTAL-HAPS ONLY	0.0028	0.0124

For the three (3) Tanks:

TOTAL VOCs	0.3340	1.4628
TOTAL-HAPS ONLY	0.0085	0.0371

STORAGE TANK SUMMARY

HAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Benzene	0.0153	0.0672
Ethylbenzene	0.0033	0.0143
Hexane	0.0234	0.1024
Naphthalene	0.0003	0.0014
Toluene	0.0312	0.1365
Trimethylpentane (2,2,4)	0.0065	0.0284
Xylene-m	0.0115	0.0503
Xylene-o	0.0058	0.0252
Xylene-p	0.0068	0.0296
Gasoline OR Fuel Oil	2.7381	11.9929
TOTAL VOCs	2.8420	12.4481
TOTAL-HAPS ONLY	0.1039	0.4551

Xylenes (mixture) 0.1051 Tons/yr

FUGITIVE EMISSIONS

Boise Facility

Notes and Comments: (Response to Comment)

1. The application did in fact account for fugitive emissions occurring for 8760 hours/year.
2. Emissions will be estimated using the revised emission factors from the EPA Protocol for Equipment Leak Emission Estimates, November, 1995. EPA-453/R-95-017. Sinclair Oil Corp. has requested in public comment that these be used in place of the 1995 "Interim" Average Emission factors that were used to establish emission limits in the proposed permit. Those emission factors are incorporated below.
Result: There is no appreciable difference between the two sets of emissions factors, as the emission factors are either identical or very close in numerical value.
3. The number of emissions sources is provided by the applicant.

SOURCE	# of Sources	Emission Factor (lb/hr/source)	Total VOC Emissions (lb/hr)	Assumed Hours/yr Operation	Total VOC Emissions (Tons/year)
GASOLINE (light liquid):					
Pump Seals	7	1.2E-03	0.008	8760	0.037
Valves	103	9.5E-05	0.010	8760	0.043
Flanges	230	1.8E-05	0.004	8760	0.018
Process Drains *1	1	0.07	0.070	8760	0.307
Oil/Water Separator	0		0.000	8760	0.000
		Lb/hr totals:	0.092	Ton/yr total	0.404
DISTILLATE FUEL OIL (heavy liquid) *2					
Pump Seals	4	2.9E-02	0.115	8760	0.502
Valves	58	5.5E-05	0.003	8760	0.014
Flanges	145	2.4E-04	0.035	8760	0.154
Process Drains *1	0	0.07	0.000	8760	0.000
Oil/Water Separator	0		0.000	8760	0.000
		Lb/hr totals:	0.153	Ton/yr total	0.670
Fugitive Grand Total (0.25 lb/hr		1.07 Ton/yr

*1 Emission factor for the drain is from AP-42 Table 9.1-2 Fugitive Emission Factors for Petroleum Refineries, October/1980

*2 Distillate fuel oil emission factors are from the August 1995 AP-42 Interim Emission Factors for Oil and Gas Production Operations

HAP Emissions = VOC Emission Rate * HAP Liquid Mass Fraction

FUGITIVE HAP EMISSIONS (Gasoline Service)

HAP Component	Liquid Mass Fraction	VOC Ems Rate (lb/hr)	HAP Emission Rate (lb/hr)	VOC emis Rate (Tons/year)	HAP Emission Rate (Tons/year)
Benzene	0.0188	0.0017	0.0017	0.0076	0.0076
Ethylbenzene	0.0207	0.0019	0.0019	0.0084	0.0084
Hexane	0.0181	0.0017	0.0017	0.0073	0.0073
Naphthalene	0.0013	0.0001	0.0001	0.0005	0.0005
Toluene	0.0972	0.0090	0.0090	0.0393	0.0393
Trimethylpentane 2,2,4	0.0151	0.0014	0.0014	0.0061	0.0061
Xylene (-m)	0.0448	0.0041	0.0041	0.0181	0.0181
Xylene (-o)	0.0349	0.0032	0.0032	0.0141	0.0141
Xylene (-p)	0.0448	0.0041	0.0041	0.0181	0.0181
Gasoline (RVP 10)	0.7043	0.0650	0.0000	0.2848	0.0000
Totals:	1.0000	0.0923	0.0273	0.4044	0.1196

FUGITIVE HAP EMISSIONS (Distillate Fuel Oil Service)

HAP Component	Liquid Mass Fraction	VOC Ems Rate (lb/hr)	HAP Emission Rate (lb/hr)	VOC Ems Rate (Tons/year)	HAP Emission Rate (Tons/year)
Benzene	0.000028	0.000004	0.000004	0.000019	0.000019
Naphthalene	0.001700	0.000260	0.000260	0.001139	0.001139
Toluene	0.000200	0.000031	0.000031	0.000134	0.000134
Xylene (-m)	0.000300	0.000046	0.000046	0.000201	0.000201
Xylene (-o)	0.000600	0.000092	0.000092	0.000402	0.000402
Xylene (-p)	0.000000	0.000000	0.000000	0.000000	0.000000
Distillate Fuel Oil #2	0.997172	0.152567		0.668242	
Totals:	1.0000	0.1530	0.00043	0.6701	0.0019

Emissions and Allowable Throughput Summary - Boise, Idaho Facility
RVP 11 Gasoline to Establish Worst Case VOC Emissions

SOURCE IDENTIFICATION	ALLOWABLE EMISSIONS				ALLOWABLE THROUGHPUT (Gallons/yr)	Allowable Product Type
	Volatile Organic Compounds (lb/hr)	(Tons/yr)	Aggregated Hazardous Air Pollutants (lb/hr)	(Tons/yr)		
STORAGE TANKS						
Tank 401	0.4831	2.1160	0.0192	0.0840	58,254,000	Gasoline
Tank 404	0.4831	2.1160	0.0192	0.0840	58,254,000	Gasoline
Tank 411	0.4831	2.1160	0.0192	0.0840	58,254,000	Gasoline
Tank 421	0.4831	2.1160	0.0192	0.0840	58,254,000	Gasoline
Tank 431	<u>0.4779</u> 2.410	<u>2.0933</u> 10.557	<u>0.0166</u> 0.093	<u>0.0725</u> 0.409	58,254,000	Gasoline
Tank 402	0.1113	0.4876	0.0028	0.0124	168,630,000	Distillate Fuel Oil
Tank 405	0.1113	0.4876	0.0028	0.0124	168,630,000	Distillate Fuel Oil
Tank 406	<u>0.1113</u> 0.334	<u>0.4876</u> 1.463	<u>0.0028</u> 0.008	<u>0.0124</u> 0.037	168,630,000	Distillate Fuel Oil
Transmix Tank 400	0.0488	0.2139	0.0011	0.0047	38,080	Gasoline
Prover Tank	<u>0.0488</u> 0.098	<u>0.2139</u> 0.428	<u>0.0011</u> 0.002	<u>0.0047</u> 0.009	220,200	Gasoline
LOADING RACK						
Gasoline Service	16.3649	71.6784	0.4189	1.8348	25,500,000	Gasoline
Distillate Fuel Oil Service	<u>1.0853</u> 17.450	<u>4.7538</u> 76.432	<u>0.0004</u> 0.419	<u>0.0019</u> 1.837	570,276,000	Distillate Fuel Oil
FUGITIVES						
Gasoline Service	0.0923	0.4044	0.0273	0.1196	N/A	
Distillate Fuel Oil Service	<u>0.1530</u> 0.245	<u>0.6701</u> 1.075	<u>0.0004</u> 0.028	<u>0.0019</u> 0.121	N/A	
Total Emissions:	20.54	89.95	0.55	2.41		

Notes:

N/A stands for Not Applicable

USING: RVP 11 GASOLINE

Annual storage tank emissions are derived from the EPA/API TANKS2.0 program.

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

06/28/96
PAGE 1

Identification

Identification No.: 401 RVP 11
City: Boise
State: ID
Company: Sinclair Oil Corp.
Type of Tank: External Floating Roof

Typical of Tanks 404, 411, 421

Tank Dimensions

Diameter (ft): 60
Volume(gallons): 839400
Turnovers: 69

Paint Characteristics

Shell Condition: Light Rust
Shell Color/Shade: White/White
Shell Paint Condition: Good

Roof Characteristics

Roof Type: Double Deck
Fitting Category: Typical

Tank Construction and Rim-Seal System

Construction: Welded
Primary Seal: Mechanical Shoe
Secondary Seal: Rim-mounted

Roof Fitting/Status

Quantity

Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

Meteorological Data Used in Emission Calculations: Boise, Idaho

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK

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PAGE 2

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)		Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations	
		Avg.	Min.	Max.	Avg.	Min.	Avg.	Min.	Max.						
Gasoline RVP 11	All	53.12	47.11	59.13	51.12		3.9508	N/A	N/A	65.164					
Gasoline - Unleaded (RVP 11)							4.9520	N/A	N/A		0.7043	0.9745	64.70	Option 4: RVP=11.00, ASTM Slope=2.5	
Benzene							0.9620	N/A	N/A		0.0188	0.0051	78.11	Option 2: A=6.9050, B=1211.033, C=220.790	
Ethylbenzene							0.0851	N/A	N/A		0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210	
Hexane (-n)							1.5952	N/A	N/A		0.0181	0.0081	86.17	Option 2: A=6.8760, B=1171.170, C=224.410	
Isooctane							0.4472	N/A	N/A		0.0151	0.0019	114.22	Option 1	
Naphthalene C-10, H-8							0.0017	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821	
Toluene							0.2655	N/A	N/A		0.0972	0.0072	92.13	Option 2: A=6.9540, B=1344.800, C=219.480	
Xylene (-m)							0.1018	N/A	N/A		0.0448	0.0013	106.17	Option 2: A=7.0090, B=1426.266, C=215.110	
Xylene (-o)							0.0553	N/A	N/A		0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690	
Xylene (-p) "Paraxylene"							0.0763	N/A	N/A		0.0448	0.0010	106.16	Option 2: A=7.0206, B=1474.403, C=217.773	

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
DETAIL CALCULATIONS (AP-42)

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PAGE 3

Annual Emission Calculations

Rim Seal Losses (lb): 537.3851
Seal Factor (lb-mole/ft yr (mph)ⁿ): 0.2000
Average Wind Speed (mph): 8.8
Seal-related Wind Speed Exponent: 1.00
Value of Vapor Pressure Function: 0.0781
Vapor Pressure at Daily Average Liquid Surface Temperature (psia): 3.950752
Tank Diameter (ft): 60
Vapor Molecular Weight (lb/lb-mole): 65.163778
Product Factor: 1.0000

Withdrawal Losses (lb): 179.6465
Annual Net Throughput (gal/yr): 58254360
Shell Clingage Factor (bbl/1000 sqft): 0.0015
Average Organic Liquid Density (lb/gal): 0.0000
Tank Diameter (ft): 60

Roof Fitting Losses (lb): 3972.4164
Value of Vapor Pressure Function: 0.0781
Vapor Molecular Weight (lb/lb-mole): 65.163778
Product Factor: 1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr): 780.6081
Average Wind Speed (mph): 8.8

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors		
		Kfa (lb-mole/yr)	Kfb (lb-mole/(yr mph ⁿ))	m
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1	1.20	0.17	1.00
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	0.00	67.00	0.98
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10	0.25	0.07	1.00
Roof Drain (3-in. Diameter)/Open	1	0.00	7.00	1.40
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1	0.95	0.14	1.00
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1	2.30	5.90	1.00
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	0.00	0.00	0.00

Total Losses (lb): 4689.45

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

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PAGE 4

Annual Emissions Report

Liquid Contents	Losses (lbs.):			Total Standing	Total
	Total Withdrawal	Roof-Fitting	Rim-Seal		
Gasoline RVP 11	179.65	3972.42	537.39	4509.80	4689.45
Gasoline - Unleaded (RVP 11)	126.53	3871.19	523.69	4394.88	4521.41
Benzene	3.38	20.07	2.72	22.79	26.17
Ethylbenzene	3.72	1.95	0.26	2.22	5.94
Hexane (-n)	3.25	32.05	4.34	36.38	39.64
Isooctane	2.71	7.50	1.01	8.51	11.22
Naphthalene C-10, H-8	0.23	0.00	0.00	0.00	0.24
Toluene	17.46	28.65	3.88	32.52	49.98
Xylene (-m)	8.05	5.06	0.69	5.75	13.80
Xylene (-o)	6.27	2.14	0.29	2.43	8.70
Xylene (-p) "Paraxylene"	8.05	3.80	0.51	4.31	12.36
Total:	179.65	3972.42	537.39	4509.80	4689.45

Response to Comments and Questions Submitted During a
Public Comment Period on Sinclair Oil Corporation (Boise)
Proposed Tier II Operating Permit (OP) for the Entire Facility

COMMENTS AND RESPONSES

Comment #1:

Sinclair's calculations showed HAP emissions at the 25 tons/year limit. DEQ's recalculation of emissions using different factors allows Sinclair to be permitted under the 25 tons/year limit. In light of the fact that Sinclair is close to being designated a major source by all calculations and that DEQ used many of Sinclair's assumptions regarding vapor pressures and HAP compositions of gasoline in their analysis the city believes that a more stringent reporting requirement is prudent.

We would recommend that Sinclair's throughput records be compiled and submitted to DEQ twice a year for review. The data should be summarized with the details provided as support, so that the throughputs can be compared to the permitted levels. This requirement should not create large additional demand on Sinclair or on DEQ. Additionally, the requirement will allow for timely evaluation of compliance with their Tier II permit. We also recommend this approach due to the proximity of the facility to a residential care center, a school, and hospital. Assurance of public health protection should be of utmost concern for the issuance of this permit.

DEQ Response:

DEQ's calculations of the potential to emit HAPs utilizes the most recent information and emissions factors available from the Environmental Protection Agency (EPA). The resulting limitation on the facility's potential to emit HAPs is below the required 10 tons per year (T/yr) of any individual HAP, and the 25 T/yr threshold for aggregated HAPs emissions. Thus, this facility has established itself as a non-major facility for HAPs. The facility is a major source of volatile organic compounds (VOCs).

The City of Boise is correct in that a large number of buildings occupied by sensitive receptors have been allowed to be built near this industrial source. DEQ will incorporate the City of Boise's request that Sinclair Oil Corporation submit semi-annual reports to DEQ's Central Office for review of compliance with petroleum product throughput limitations in Tier II Operating Permit #001-00112. The information required to be monitored, recorded, and then compiled on a monthly basis in Section 4.1 on page 3 of 10 (Storage Tanks), and Section 4.1 on page 5 of 10 (Loading Rack), shall be compiled for six (6) consecutive months, and submitted to DEQ for review. Therefore, Section 5, Reporting Requirements, on the permit pages listed above will be altered to reflect this reporting requirement.

These reports shall be reviewed to determine compliance with the annual throughput and emission limits in the operating permit. However, this reporting requirement does not supersede DEQ's ability to determine compliance with the permit's limitations on a monthly basis, rather than a semiannual basis. As a major source of VOCs, this facility will undergo an annual inspection by DEQ. Inspection of the facility may or may not coincide with the submittal of these reports. It is important to note that a compliance determination with the annual rolling limitation can be established monthly (as soon as either an entire year of data is compiled), or non-compliance can be established prior to the compilation of an entire year of data in the event the data shows that the annual limitation has been exceeded.

Any requests for treatment of the information as "confidential" must follow the substantive and procedural requirements outlined in IDAPA 16.01.01.126 of the Rules for the Control of Air Pollution in Idaho (Rules), and Idaho Code 39-111.

Comment #2:

Fugitive Emissions: The fugitive emission calculation submitted with the Permit application was based upon Refinery Average Emission Factors applied at 8,760 hours per year. Subsequent to Permit application submittal, the protocol document has been revised. The new revision includes Marketing Terminal Average Emission Factors which are directly applicable to fugitive sources in light liquid (i.e., gasoline) service. SOC believes these factors more accurately reflect the fugitive emissions from light liquid service at this facility. Inclusion of the new factor significantly reduces the fugitive VOC and HAP emission from the facility and SOC supports the use of these factors for this application. The Division's technical analysis utilized "Interim" Emissions Factors for light liquid service which correspond closely to the Marketing Terminal Average Emission Factors.

With regard to emissions from fugitive sources in heavy liquid (i.e., fuel oil) service, neither the Interim factors nor the Marketing Terminal Average Emission Factors include corresponding factors for fuel oil service. The Division utilized "light oil" from Average Emission Factors for Oil and Gas Production Operations for the fuel oil emission factors. Sinclair is concerned with the use of the "Oil and Gas Production" factors for fuel oil service because these factors result in a higher emissions (lb/hr/source) than the corresponding gasoline service factors.

Fugitive emissions from gasoline service tend to be greater than fugitive emissions from fuel oil service. Sinclair also recognizes that more accurate factors may not yet be developed for the fuel oil service application. Although the fuel oil service factors used in the technical analysis overpredict fugitive fuel oil emission, thus providing a conservative estimate of these emissions, Sinclair agrees with the Division's assessment of fugitive emissions from fuel oil service.

DEQ Response:

Gasoline Service

Sinclair is correct in stating that the original permit application estimated fugitive volatile organic compounds (VOCs) and hazardous air pollutant (HAPs) emissions continuously--or 8760 hours per year.

The 1993 EPA Protocol for Equipment Leak Emission Estimates¹ (1993 Protocol) was used to set emission limits in the permit application. The 1995 "Interim" emission factors² used to establish the proposed permit's emission limits were much smaller than those in the 1993 Protocol. This accounted for a lower level of allowable fugitive emissions in the proposed permit than originally applied for.

The "Interim" emission factors for pump seals, valves, and flanges in light liquid (gasoline) service are either identical, or nearly so, when compared to the Marketing Terminal Average Emission Factors, published in the 1995 Protocol³. Fugitive emissions from gasoline service were recalculated using the 1995 Protocol emission factors (see attachment). The difference in estimated fugitive emissions was negligible. Therefore, the allowable pollutant emissions permit limits and gasoline throughput limits will remain unchanged.

Distillate Fuel Oil Service

DEQ agrees with Sinclair's comment that fugitive emissions from gasoline service should be greater than for distillate fuel oil service. At the present time there are no Marketing Terminal Average Emission factors for distillate fuel oil service. In the absence of actual screening values for the distillate fuel oil service emission sources, DEQ maintained that the apparently conservative emission factors used in the proposed permit's analysis, was the only option available. The final result and goal of this Tier II Operating Permit is to establish the facility as a "synthetic minor" for HAPs emissions.

¹ Protocol for Equipment Leak Emission Estimates, EPA-453/R-93-026, June 1993, USEPA.

² New Equipment Leak Emissions Factors for Petroleum Refineries, Gasoline Marketing and Oil and Gas Production Operations, February 1995, USEPA.

³ Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995, USEPA.

FUGITIVE EMISSIONS

Bolse Facility

Notes and Comments: (Response to Comment)

1. The application did in fact account for fugitive emissions occurring for 8760 hours/year.
2. Emissions will be estimated using the revised emission factors from the EPA Protocol for Equipment Leak Emission Estimates, November, 19 EPA-453/R-95-017. Sinclair Oil Corp. has requested in public comment that these be used in place of the 1995 "Interim" Average Emission factors that were used to establish emission limits in the proposed permit. Those emission factors are incorporated below.
Result: There is no appreciable difference between the two sets of emissions factors, as the emission factors are either identical or very close in numerical value.
3. The number of emissions sources is provided by the applicant.

SOURCE	# of Sources	Emission Factor (lb/hr/source)	Total VOC Emissions (lb/hr)	Assumed Hours/yr Operation	Total VOC Emissions (Tons/year)
GASOLINE (light liquid):					
Pump Seals	7	1.2E-03	0.008	8760	0.037
Valves	103	9.5E-05	0.010	8760	0.043
Flanges	230	1.8E-05	0.004	8760	0.018
Process Drains *1	1	0.07	0.070	8760	0.307
Oil/Water Separator	0		0.000	8760	0.000
		Lb/hr totals	0.092	Ton/yr tota	0.404
DISTILLATE FUEL OIL (heavy liquid) *2					
Pump Seals	4	2.9E-02	0.115	8760	0.502
Valves	58	5.5E-05	0.003	8760	0.014
Flanges	145	2.4E-04	0.035	8760	0.154
Process Drains *1	0	0.07	0.000	8760	0.000
Oil/Water Separator	0		0.000	8760	0.000
		Lb/hr totals	0.153	Ton/yr tota	0.670

Original analysis estimated emissions at 0.403 ton/yr. This is not significant.

Fugitive Grand Total (0.25 lb/hr 1.07 Ton/yr

*1 Emission factor for the drain is from AP-42 Table 9.1-2 Fugitive Emission Factors for Petroleum Refineries, October/1980

*2 Distillate fuel oil emission factors are from the August 1995 AP-42 Interim Emission Factors for Oil and Gas Production Operations

HAP Emissions = VOC Emission Rate * HAP Liquid Mass Fraction

FROM 1995 Leaks Document. → EPA Protocol for Equipment Leak Emission Estimates, Nov. 1995.

TABLE 2-3. MARKETING TERMINAL AVERAGE EMISSION FACTORS

Equipment type	Service	Emission factor (kg/hr/source) ^a	lbm/hr/source
Valves	Gas	1.3E-05	
	Light Liquid	4.3E-05	9.5E-5
Pump seals	Gas	6.5E-05	
	Light Liquid	5.4E-04	1.2E-3
Others (compressors and others) ^b	Gas	1.2E-04	
	Light Liquid	1.3E-04	2.9E-4
Fittings (connectors and flanges) ^c	Gas	4.2E-05	
	Light Liquid	8.0E-06	1.8E-5

^aThese factors are for total organic compound emission rates (including non-VOC's such as methane and ethane).

^bThe "other" equipment type should be applied for any equipment type other than fittings, pumps, or valves.

^c"Fittings" were not identified as flanges or non-flanged connectors; therefore, the fitting emissions were estimated by averaging the estimates from the connector and the flange correlation equations.

where lbm = POUND mass = 2.20462 lbm Per Kilogram.

$$\left(4.3 \text{E-}5 \frac{\text{kg}}{\text{hr/source}} \right) \left(\frac{2.20462 \text{ lbm}}{1 \text{ kg}} \right) = 9.5 \frac{\text{lb}}{\text{hr/source}}$$



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JUN 17 1996

DIV. OF ENVIRONMENTAL QUALITY
PERMITS & ENFORCEMENT

June 12, 1996

Mr. Orville D. Green, Assistant Administrator
Permits and Enforcement
Idaho Department of Health and Welfare
Division of Environmental Quality
1410 North Hilton
Boise, Idaho 83706-1255

Re: Sinclair Oil Corporation (Boise) - #9509-137-2
Tier 2 Operating Permit #001-00112
Submittal of Revised Allowable Emissions

Dear Mr. Green:

On May 3, 1996, the Division of Environmental Quality (DEQ) granted Sinclair Oil Corporation (SOC) a hold on the issuance of Tier 2 Operating Permit #001-00112. SOC requested the hold in order to revise the permit's allowable emissions.

Please find attached, the revised forms and text (denoted by revision #1) identifying the requested changes to the Tier 2 Operating Permit Application. Please replace the appropriate portions of the Tier 2 Operating Permit Application initial submittal with these revisions.

These revisions reflect a decrease in the allowable gasoline grade petroleum product which may be distributed through the loading rack (EU #11). In addition, the allowable distillate fuel oil grade petroleum product which may be distributed through the loading rack increased. These changes result in a substantial decrease in the facility-wide allowable emissions. Please note that the allowable emissions from Emissions Units 1 through 10 and the allowable fugitive emissions remain unchanged with respect to the Proposed Tier 2 Operating Permit review package dated February 13, 1996.

Should you have any questions regarding the information in this application, please call me at (801) 524-2729.

Respectfully,

Samuel B. Greene P.E.
Corporate Air Quality Engineer

attachments

cc: Kevin Brown w/o/a Mark Peterson w/o/a
Klane Forsgren w/o/a David Stice w/o/a

Tier 2 Operating Permit Application
Boise Products Terminal
Sinclair Oil Corporation
Revision 1, June 12, 1996

Table 4.1 Maximum Potential Emissions Summary

EU #	Description	Maximum Potential VOC Emissions (TPY) ¹	Maximum Potential HAP Emissions (TPY) ¹
1	Tank 401	2.12	0.084
2	Tank 404	2.12	0.084
3	Tank 411	2.12	0.084
4	Tank 421	2.12	0.084
5	Tank 431	2.09	0.073
6	Tank 402	0.49	0.012
7	Tank 405	0.49	0.012
8	Tank 406	0.49	0.012
9	Transmix Tank 400	0.21	0.005
10	Prover Tank	0.21	0.005
11	Loading Rack - gasoline	34.0	0.929
	Loading Rack - distillate oil	4.75	0.120
	Fugitive Emissions	1.07	0.121
	TOTAL EMISSIONS	52.3	1.6

The allowable emissions from Emissions Units 1 through 10 and the allowable fugitive emissions remain unchanged with respect to Appendix A of the proposed Tier 2 Operating Permit review package dated February 13, 1996

4.2.2 Fixed Roof Tanks (EU # 6 7 and 8):

Distillate fuel oil grade petroleum products can be stored in these tanks. Emissions from these units are a result of breathing and working losses as defined per AP-42 methodology. The maximum potential emissions from any one of these tanks occurs when distillate grade petroleum product is loaded, stored and unloaded at the defined maximum throughput. The maximum throughput for any one of these tanks is defined as the capacity of the pipeline supplying the terminal distributed to two of the three

Tier 2 Operating Permit Application
Boise Products Terminal
Sinclair Oil Corporation
Revision 1, June 12, 1996

Table 4.2 Maximum Annual Product Throughput Limits

EU #	Description	Maximum EU Throughput (gpy)
1	Tank 401	58,254,000
2	Tank 404	58,254,000
3	Tank 411	58,254,000
4	Tank 421	58,254,000
5	Tank 431	58,254,000
6	Tank 402	168,630,000
7	Tank 405	168,630,000
8	Tank 406	168,630,000
9	Transmix Tank 400	38,080
10	Prover Tank	220,200
11	Loading Rack - gasoline	11,850,000
	Loading Rack - distillate oil	570,276,000

4.4.1 Storage Tank Monitoring (EU # 1 through 9)

The operator will record the quantity of product received in all storage tanks. This information will be compiled on an annual basis to determine annual product throughput. Periods of excess emissions will be defined as any calendar year (January 1 to December 31) in which the annual throughput of the individual storage tank exceeds the limits indicated in Table 4.2.

4.4.2 Prover (EU # 10)

The operator will compile, on an annual basis, the volume of product transferred to the prover. This information is proportional to the number of flowmeter calibration cycles during the year. Periods of excess emissions will be defined as any calendar year (January 1 to December 31) in which the annual throughput of the prover tank exceeds the limit indicated in Table 4.2.

Tier 2 Operating Permit Application
Boise Products Terminal
Sinclair Oil Corporation
Revision 1, June 12, 1996

APPENDIX: D PROPOSED PERMIT CONDITIONS

1. The facility shall be limited to a maximum annual product throughput rate as listed in Table D.1:

Table D.1: Maximum Annual Product Throughput Limits

EU #	Description	Maximum EU Throughput (gpy)
1	Tank 401	58,254,000
2	Tank 404	58,254,000
3	Tank 411	58,254,000
4	Tank 421	58,254,000
5	Tank 431	58,254,000
6	Tank 402	168,630,000
7	Tank 405	168,630,000
8	Tank 406	168,630,000
9	Transmix Tank 400	38,080
10	Prover Tank	220,200
11	Loading Rack - gasoline	11,850,000
	Loading Rack - distillate oil	570,276,000

2. Compliance with the permitted maximum potential emissions limit will be based upon monitoring the annual product throughput of each EU. Reporting of the annual EU product throughput will be combined with the registration of emissions and payment of fees for Tier 1 permits (re: IDAPA 16.01.01 Section 525).
3. A period of excess emissions is defined to be any calendar year (January 1 to December 31) in which the annual throughput of the individual EU exceeds the limit indicated in Table D.1.

SECTION 1: GENERAL INFORMATION

COMPANY & DIVISION NAME	Sinclair Oil Corporation / Boise Products Terminal			Revised 1, May 10, 1998
STREET ADDRESS OR P.O. BOX	712 North Curtis			
CITY	Boise			
STATE	Idaho	ZIP	83706	
PERSON TO CONTACT	Sam Greene			
TITLE	Corporate Air Quality Engineer			
PHONE NUMBER	(801)524-2729			
EXACT PLANT LOCATION	S-8, T-3N, R-2E			
GENERAL NATURE OF BUSINESS	Petroleum Products Storage and Loading			
NUMBER OF FULL-TIME EMPLOYEES	0.5			
PROPERTY AREA (ACRES)		REASON FOR APPLICATION	6	
		(1) Permit to Construct a new facility; (2) Permit to Modify an existing source; (3) Permit to Construct a new source at an existing facility; (4) Change of Owner or Location; (5) Tier I Permit to Operate; (6) Tier II Permit to Operate		
DISTANCE TO NEAREST STATE BORDER (MILES)	50			
PRIMARY SIC		SECONDARY SIC		
PLANT LOCATION COUNTY	Ada	ELEVATION (FT)	2710	
UTM ZONE	11			
UTM (X) COORDINATE (KM)	560463	UTM (Y) COORDINATE (KM)	4828630	

NAME OF FACILITIES LOCATION OF OTHER FACILITIES
List all facilities within the state that are under your control, or under common control, and have emissions to the air. If none, so state

Boise Products Terminal	425 east Hwy 81 Boise Idaho 83318 Cassia County
Boise Products Terminal	712 North Curtis Boise Idaho 83706 Ada County
OWNER OR RESPONSIBLE OFFICIAL	Mark Peterson
TITLE OF RESPONSIBLE OFFICIAL	Manager, Pipeline and Terminals

Based on information and belief formed after reasonable inquiry, I certify the statements and information in this document are true, accurate, and complete.

SIGNATURE OF OWNER OR RESPONSIBLE OFFICIAL



DATE

1/1/00

SECTION 6: LOADING RACKS

DEQ USE ONLY

DEQ PLANT ID CODE

DEQ PROCESS CODE

DEQ STACK ID CODE

DEQ BUILDING ID CODE

PRIMARY SCC

SECONDARY SCC

DEQ SEGMENT CODE

PART A: LOADING RACK DATA

PROCESS CODE OR DESCRIPTION

DISTILLATE FUEL OIL LOADING

Revision 1, May 10, 1995

STACK DESCRIPTION

EU #11

BUILDING DESCRIPTION

DATE INSTALLED OR LAST MODIFIED

1952

TYPE OF LOADING

3,4

Please choose from the following:

- (01) Overhead loading - splash fill, normal service;
- (02) Overhead loading - splash fill, balanced service;
- (03) Overhead loading - submerged fill, normal service;
- (04) Overhead loading - submerged fill, balanced service;
- (05) Bottom loading - normal service;
- (06) Bottom loading - balanced service

LOADING ARM VAPOR CLOSURE

5

Please choose from the following:

- (01) Incineration;
- (02) GREENWOOD;
- (03) SOCO;
- (04) CHICKSAN;
- (05) None - open to air;
- (06) Other

MATERIAL LOADED

DISTILLATE FUEL OIL

ANNUAL THROUGHPUT (GAL.)

570,368 maximum



REID VAPOR PRESSURE (PSI)

0.022 (annual average) (0.05 maximum)

MAXIMUM MATERIAL TEMPERATURE (DEG. F)

59 (annual average maximum)

AVERAGE MATERIAL TEMPERATURE (DEG. F)

51 (daily average)

SECTION 6, PART B

EU #11, DISTILLATE FUEL OIL

OPERATING DATA

Revised 1, Nov 10 1995

PERCENT FUEL CONSUMPTION PER QUARTER

DEC-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE

HOURS/DAY	24
DAYS/WEEK	7
WEEKS/YEAR	52

POLLUTION CONTROL EQUIPMENT

PARAMETER	PRIMARY	SECONDARY
TYPE	N/A	N/A
TYPE CODE (FROM APP. A)		
MANUFACTURER		
MODEL NUMBER		
PRESSURE DROP (IN. OF WATER)		
WET SCRUBBER FLOW (GPM)		
BAGHOUSE AIR/CLOTH RATIO (FPM)		

VENTILATION AND BUILDING/AREA DATA

ENCLOSED? (Y/N)	N/A
HOOD TYPE (FROM APP. B)	
MINIMUM FLOW (ACFM)	
PERCENT CAPTURE EFFICIENCY	
BUILDING HEIGHT (FT)	
BUILDING LENGTH (FT)	
BUILDING WIDTH (FT)	

STACK DATA

GROUND ELEVATION (FT)	N/A
UTM X COORDINATE (KM)	
UTM Y COORDINATE (KM)	
STACK TYPE (SEE NOTE BELOW)	
STACK EXT HEIGHT FROM GROUND LEVEL (FT)	
STACK EXT DIAMETER (FT)	
STACK EXT GAS FLOWRATE (ACFM)	
STACK EXT TEMPERATURE (DEG. F)	

AIR POLLUTANT EMISSIONS

POLLUTANT	CAS NUMBER	EMISSION FACTOR (SEE NOTE BELOW)	PERCENT CONTROL EFFICIENCY	ESTIMATED OR MEASURED EMISSIONS (LBS/MR)	ALLOWABLE EMISSIONS		
					(LBS/MR)	(TONS/YR)	REFERENCE
PM							
PM-10							
SO ₂							
CO							
NO _x							
VOC			0		1.1	4.8	AP-42
LEAD							
Xylenes	1330-20-7		0		1.5E-02	8.9E-02	AP-42
Toluene	108-88-3		0		1.1E-02	4.9E-02	AP-42
Napthalene	91-20-3		0		5.4E-04	2.4E-03	AP-42

NOTES: STACK TYPE - (01) DOWNWARD; (02) VERTICAL (UNCOVERED); (03) VERTICAL (COVERED); (04) HORIZONTAL; (05) FUGITIVE
EMISSION FACTOR - IN LBS/UNIT. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

SECTION 6: LOADING RACKS

DEQ USE ONLY

DEQ PLANT ID CODE

DEQ PROCESS CODE

DEQ STACK ID CODE

DEQ BUILDING ID CODE

PRIMARY SCC

SECONDARY SCC

DEQ SEGMENT CODE

PART A: LOADING RACK DATA

PROCESS CODE OR DESCRIPTION

GASOLINE LOADING

Revision 1, May 10, 1996

STACK DESCRIPTION

EU # 11

BUILDING DESCRIPTION

DATE INSTALLED OR LAST MODIFIED

1952

TYPE OF LOADING

3.4

Please choose from the following:

- (01) Overhead loading - splash fill, normal service;
- (02) Overhead loading - splash fill, balanced serviced;
- (03) Overhead loading - submerged fill, normal service;
- (04) Overhead loading - submerged fill, balanced service;
- (05) Bottom loading - normal service;
- (06) Bottom loading - balanced service

LOADING ARM VAPOR CLOSURE

Please choose from the following:

- (01) Incineration;
- (02) GREENWOOD;
- (03) SOCO;
- (04) CHICKSAN;
- (05) None - open to air;
- (06) Other

5

MATERIAL LOADED

GASOLINE

ANNUAL THROUGHPUT (GAL)

11,955

(maximum)



REID VAPOR PRESSURE (PSI)

annual
average=10

(15 maximum)

MAXIMUM MATERIAL TEMPERATURE (DEG. F)

59

(annual average maximum)

AVERAGE MATERIAL TEMPERATURE (DEG. F)

51

(daily average)

SECTION 6, PART B

EU #11, GASOLINE

OPERATING DATA

Revision 1, May 18, 1988

PERCENT FUEL CONSUMPTION PER QUARTER

OCT-FEB	25
MAR-MAY	25
JUN-AUG	25
SEP-NOV	25

OPERATING SCHEDULE

HOURS/DAY	24
DAYS/WEEK	7
WEEKS/YEAR	52

POLLUTION CONTROL EQUIPMENT

PARAMETER

TYPE

TYPE CODE (FROM APP. A)

MANUFACTURER

MODEL NUMBER

PRESSURE DROP (IN. OF WATER)

WET SCRUBBER FLOW (GPM)

BAGHOUSE AIR/CLOTH RATIO (FPM)

PRIMARY

N/A

SECONDARY

N/A

VENTILATION AND BUILDING AREA DATA

ENCLOSED? (Y/N)

HOOD TYPE (FROM APP. B)

MINIMUM FLOW (ACFM)

PERCENT CAPTURE EFFICIENCY

BUILDING HEIGHT (FT)

BUILDING LENGTH (FT)

BUILDING WIDTH (FT)

N/A

STACK DATA

GROUND ELEVATION (FT)

UTM X COORDINATE (KM)

UTM Y COORDINATE (KM)

STACK TYPE (SEE NOTE BELOW)

STACK EXIT HEIGHT FROM GROUND LEVEL (FT)

STACK EXIT DIAMETER (FT)

STACK EXIT GAS FLOWRATE (ACFM)

STACK EXIT TEMPERATURE (DEG. F)

N/A

AIR POLLUTANT EMISSIONS

POLLUTANT

CAS NUMBER

EMISSION
FACTOR
(SEE NOTE
BELOW)PERCENT
CONTROL
EFFICIENCYESTIMATED OR
MEASURED
EMISSIONS
(LBS/MR)

ALLOWABLE EMISSIONS

(LBS/MR)

(TONS/YR)

REFERENCE

PM

PM-10

SO₂

CO

NO_x

VOC

LEAD

Benzene

71-43-2

Hexane

110-54-3

Xylenes

1330-20-7

Toluene

108-88-3

Ethylbenzene

100-41-4

Naphthalene

91-20-3

Trimethylpentane

540-84-1

0

0

0

0

0

0

0

0

7.8

34.01

AP-42

4.20E-02

0.18

AP-42

6.70E-02

0.30

AP-42

2.30E-02

0.10

AP-42

3.90E-02

0.28

AP-42

3.90E-03

1.7E-02

AP-42

3.00E-06

2.2E-03

AP-42

1.70E-02

7.5E-02

AP-42

NOTES:

STACK TYPE - 01) DOWNWARD; 02) VERTICAL (UNCOVERED); 03) VERTICAL (COVERED); 04) HORIZONTAL; 05) FUGITIVE
EMISSION FACTOR - IN LBS/UNIT. PLEASE USE SAME HOURLY UNITS GIVEN IN FUEL DATA SECTION.

Potential Emissions - Loading Rack

Formula: Loading Losses (lb/1000 gal) = (12.46)(S)(P)(M)/T

Where: S = saturation factor
P = True Vapor Pressure (psia)
M = Molecular Weight of Vapor
T = Liquid Temperature (deg. R)

Loading rack emissions - gasoline

Daily Loadout 773 BPD
Annual Throughput 11650.09 M gpy

MW 66.503
Pvap 3.54 psia
Saturation Factor 1
Temperature 511 deg. R
Emission Factor 5.7404 lb/M gal
Total VOC emission rate 34.01 TPY

	Component	Vapor Mass Fraction	Emission Rate (TPY)	HAP Emission Rate (TPY)
1	Benzene	0.0064	0.1837	0.1837
2	Hexane	0.0067	0.2959	0.2959
3	Xylene-o	0.0008	0.0204	0.0204
4	Xylene-m	0.0013	0.0442	0.0442
5	Xylene-p	0.001	0.0340	0.0340
6	Toluene	0.0076	0.2595	0.2595
7	Ethylbenzene	0.0006	0.0170	0.0170
8	Napthalene	5.85E-07	0.0000	0.0000
9	Trimethylpentane (2,2,4)	0.0022	0.0748	0.0748
10	Gasoline(RVP10)	0.9727	33.0805	
	TOTAL	1	34.0121	0.9296

Loading rack emissions - fuel oil

Daily Loadout 37200 BPD
Annual Throughput 570276 M gpy

MW 129.037
Pvap 0.0053 psia
Saturation Factor 1
Temperature 511 deg. R
Emission Factor 0.0167 lb/M gal
Total VOC emission rate 4.75 TPY

	Component	Vapor Mass Fraction	Emission Rate (TPY)	HAP Emission Rate (TPY)
1	Benzene	0.000000	0.000000	0.000000
2	Xylene-o	0.003100	0.014740	0.014740
3	Xylene-m	0.011500	0.054681	0.054681
4	Xylene-p		0.000000	0.000000
5	Toluene	0.010200	0.048500	0.048500
5	Napthalene	0.000600	0.002377	0.002377
7	Fuel oil #2	0.974700	4.834611	
	TOTAL	1.000000	4.754911	0.120299

PUBLIC WORKS DEPARTMENT
CITY HALL
4TH FLOOR



H. BRENT COLES
MAYOR

COUNCIL MEMBERS

PAULA FORNEY
COUNCIL PRESIDENT
CAROLYN TERTELING
COUNCIL PRO TEM

SARA BAKER
ANNE STITES HAUSRATH
M. JEROME MAPP
MIKE WETHERELL

March 14, 1996

Mr. Tony Wilson
Program Development Specialist
Division of Environmental Quality
1410 N. Hilton St.
Boise ID 83706-1255

RECEIVED

MAR 19 1996

**DIV. OF ENVIRONMENTAL QUALITY
PERMITS & ENFORCEMENT**

Dear Mr. Wilson:

The City of Boise has reviewed Sinclair Oil's public review package for the proposed Tier II Operating Permit and has the following comments.

Sinclair's calculations showed HAP emissions at the 25 tons/year limit. DEQ's recalculation of emissions using different factors allows Sinclair to be permitted under the 25 tons/year limit. In light of the fact that Sinclair is close to being designated a major source by all calculations and that DEQ used many of Sinclair's assumptions regarding vapor pressures and HAP compositions of gasoline in their analysis; the city believes that a more stringent reporting requirement is prudent.

We would recommend that Sinclair's throughput records be compiled and submitted to DEQ twice a year for review. The data should be summarized with the details provided as support, so that the throughputs can be compared to the permitted levels. This requirement should not create large additional demands on Sinclair or on DEQ. Additionally, the requirement will allow for timely evaluation of compliance with the Tier II permit. We also recommend this approach due to the proximity of the facility to a residential care center, a school and hospital. Assurance of public health protection should be of utmost concern for the issuance of this permit.

The City of Boise appreciates the opportunity to respond to this public notice.

Sincerely,

Carl Ellsworth
Environmental Division Manager

cc: Bill Ancell
Mayor Coles

cc/wp/bbeird/dwp/sinclair.let
CF/SF GWP-900



*Tony -
Darius - Soc - please
service fill process -
Br*
RECEIVED

March 20, 1996

MAR 21 1996

**DIV. OF ENVIRONMENTAL QUALITY
PERMITS & ENFORCEMENT**

Mr. Brian R. Monson, Bureau Chief
Operating Permits Bureau
Idaho Department of Health and Welfare
Division of Environmental Quality
1410 North Hilton
Boise, Idaho 83706-1255

Re: Sinclair Oil Corporation (Boise) - #9509-137-2
Approval of Proposed Tier 2 Operating Permit #001-00112

Dear Mr. Monson:

Sinclair Oil Corporation (SOC) has reviewed the Proposed Tier 2 Operating Permit (Permit) for our Boise facility, which is currently undergoing a public comment period. SOC feels that the proposed Permit accurately reflects the requested operating conditions and limitations presented in the permit application. SOC has identified items in the technical analysis portion of the Permit that may require revision or clarification in order for the Permit to be technically accurate. These items are included as an attachment to this letter.

Please call me at (801) 524-2729 if you would like to discuss this information.

Respectfully,

Samuel B. Greene P.E.
Corporate Air Quality Engineer

attachments

cc: K. Brown
K. Forsgren
M. Peterson
D. Stice

Attachment A: Comments on Technical Analysis

Fugitive Emissions

The fugitive emission calculation submitted with the Permit application was based upon Refinery Average Emission Factors¹ applied at 8,760 hours per year. Subsequent to Permit application submittal, the protocol document has been revised. The new revision includes Marketing Terminal Average Emission Factors² which are directly applicable to fugitive sources in light liquid (ie. gasoline) service. SOC believes these factors more accurately reflect the fugitive emissions from light liquid service at this facility. Inclusion of the new factors significantly reduces the fugitive VOC and HAP emissions from the facility and SOC supports the use of these factors for this application. The Division's technical analysis utilized "Interim" Emissions Factors³ for light liquid service which correspond closely to the Marketing Terminal Average Emission Factors.

With regard to emissions from fugitive sources in heavy liquid (ie. fuel oil) service, neither the Interim factors nor the Marketing Terminal Average Emission Factors include corresponding factors for fuel oil service. The Division utilized "light oil" from Average Emission Factors for Oil and Gas Production Operations⁴ for the fuel oil emission factors. SOC is concerned with the use of the "Oil and Gas Production" factors for fuel oil service because these factors result in a higher emissions (lb/hr/source) than the corresponding gasoline service factors.

Fugitive emissions from gasoline service tend to be greater than fugitive emissions from fuel oil service. SOC also recognizes that more accurate factors may not yet be developed for the fuel oil service application. Although the fuel oil service factors used in the technical analysis overpredict fugitive fuel oil

¹ Protocol for Equipment Leak Emissions Estimates, EPA-453/R-93-026 June 1993, USEPA Emission Standards Division.

² Protocol for Equipment Leak Emissions Estimates, EPA-453/R-95-017, November 1995, USEPA Emission Standards Division.

³ New Equipment Leak Emissions Factors for Petroleum Refineries, Gasoline Marketing and Oil and Gas Production Operations, February 1995, USEPA.

⁴ New Equipment Leak Emissions Factors for Oil and Gas Production Operations, August 1995, USEPA.

emissions, thus providing a conservative estimate of these emissions, SOC agrees with the Division's assessment of fugitive emissions from fuel oil service.

Meteorological Data

The meteorological data used for the emissions analysis in the permit application needs to be clarified. For the Boise Terminal (#9509-137-2) Tier 2 Operating Permit Application, Tanks 2.0 meteorological data for Boise, Idaho was used. For the Burley Terminal (#9509-138-2) Tier 2 Operating Permit Application, Tanks 2.0 meteorological data for Pocatello, Idaho was used. This resulted in annual average tank liquid temperatures of 51.1°F for the Boise facility and 46.6°F for the Burley facility. Pocatello was chosen for the Burley facility because it was the closest city to Burley in the Tanks 2.0 database.

February 13, 1996

MEMORANDUM

TO: Brian R. Monson, Chief *BRM*
Operating Permits Bureau
Permits and Enforcement

FROM: Darin A. Mehr, Air Quality Engineer *DA M*
Operating Permits Bureau
Wade Woolery, Air Quality Engineer *W*
Technical Services Bureau

THROUGH: Susan J. Richards, Air Quality Permits Manager *SJR*
Operating Permits Bureau

SUBJECT: Technical Analysis for Proposed Tier II Operating Permit #001-00112
Sinclair Oil Corporation (Boise)

PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 16.01.01 Sections 400 through 406 of the Rules for the Control of Air Pollution in Idaho (Rules) for issuing Operating Permits.

FACILITY DESCRIPTION

Sinclair Oil Corporation's (Sinclair) Boise, Idaho, facility distributes petroleum products received through the Chevron supply pipeline originating in Salt Lake City, Utah. Petroleum products consisting of various grades of gasoline and distillate fuel oil are temporarily stored in tanks prior to transfer to mobile carrier tanks for transport and delivery off-site.

PROJECT DESCRIPTION

This project is for the development of an Operating Permit (OP) that will create state and federally enforceable limitations on the facility's potential to emit hazardous air pollutants (HAPs). This permit would make the Boise facility a synthetic minor for HAP emissions, which allows the facility to be recognized as an "area source" for HAPs. Bulk gasoline distributors that are recognized as area sources of HAPs avoid the stringent control technology installation requirements of the Bulk Gasoline Distribution MACT standards.

The OP will address the following existing point and fugitive emission sources:

Gasoline Storage Tanks

The following tanks are used to store gasoline grade petroleum product. Less volatile distillate fuel oil may be stored in these tanks, which results in lesser emissions in comparison to storage of gasoline, and thus, does not increase the facility's potential to emit volatile organic compounds (VOCs) or HAPs.

TANK IDENTIFICATION #	STORAGE CAPACITY (gallons)
401	839,400
404	839,400
411	839,400
421	839,400
431	3,323,800

Distillate Fuel Oil Storage Tanks

The following tanks are used to store distillate fuel oil grade petroleum products:

TANK IDENTIFICATION #	STORAGE CAPACITY (gallons)
402	839,300
405	839,300
406	839,300

The following two tanks can be considered as "process" tanks. The Prover Tank is used to verify the quantities of petroleum product being transferred to carrier tanks for off-site transport and delivery. The "Trans-Mix" Tank is used to store waste petroleum products (off specification fuels, residual product from other tanks, etc.).

TANK IDENTIFICATION #	STORAGE CAPACITY (gallons)
Prover, #400	734
Trans-Mix	3,308

The facility is equipped with a double bay loading rack. The loading rack system is a submerged pipe design where one or more loading arms of the loading rack system is/are placed in the access hatches in the top of the carrier tank positioned in either loading bay. The submerged fill design reduces loading emissions by decreasing turbulence in the liquid during the transfer process. No additional emissions control equipment is employed.

DOUBLE BAY LOADING RACK	MAXIMUM DAILY THROUGHPUT (gallons/day)
Gasoline Service	638,400
Distillate Fuel Oil Service	924,000

The following equipment is identified as fugitive emissions sources for VOCs and HAPs:

SOURCE	NUMBER OF SOURCES IDENTIFIED
Gasoline Service	7
Pump Seals	
Valves	103
Flanges	230
Process Drains	1
Oil/Water Separators	0.00
Distillate Fuel Oil Service	4
Pump Seals	
Valves	58
Flanges	145
Process Drains	0.00
Oil/Water Separators	0.00

Specific details about the process description can be found in the application materials provided by the Sinclair Oil Corporation.

SUMMARY OF EVENTS

On September 12, 1995, DEQ received an application for a Tier II OP. This application was declared administratively complete on October 12, 1995. Additional information was received on November 29, 1995, and on January 10, 1996.

The required public comment period is scheduled to start on or around February 23, 1996 and will end on or around March 23, 1996. If the public comment period is scheduled to end on March 23rd (a Saturday), public comment will be accepted until Monday, March 25, 1996.

DISCUSSION

1. Emission Estimates

Emission estimates were originally provided by Sinclair in the September 12, 1995 submittal. Additional supporting calculations and documentation were included in the November 29, 1995, and January 10, 1996, submittals.

The intent of this Tier II permit application is to establish enforceable emission limits for HAPs below the 10/25 ton per year (T/yr) thresholds for single/aggregated HAPs. The facility would be a major source regardless, as the facility's actual annual VOC emissions exceed the 100 T/yr threshold.

Gasoline Physical Properties Assumptions

There were a number of important Sinclair assumptions that DEQ had to accept in order to use Sinclair's emission estimate methodology. Gasoline service emissions constitute the vast majority of the facility's VOC and HAP emissions. The methodology employed was used to determine permit allowable VOC and HAP emissions. The following three (3) points are the most critical to this permitting analysis (see Attachment A to review a copy of DEQ's emission estimates):

1. Gasoline with a Reid Vapor Pressure of ten (10) pounds per square inch absolute (psia) is representative of an annual average Reid Vapor Pressure (RVP) for gasoline.
2. Various grades of gasoline (winter blend unleaded regular versus summer blend unleaded premium, etc.) have different individual HAP compositions. The HAP compositions will also vary from refinery to refinery.
3. The HAP emissions associated with the RVP 10 psia case are the worst case emissions with regard to potential to emit.

Gasoline RVP is increased during colder months to allow for easier, more efficient, internal combustion engine starting, warmup, and operation. In warmer summer months, the RVP is decreased to reduce problems with vapor lock during engine operation. Lowering the RVP property in gasoline reduces VOC emissions from the volatile gasoline product. The summer months (May 1 through September 15) are identified as the "ozone season." Fuel volatility--specifically gasoline RVP--is regulated in all states within the U.S. during these months by 40 CFR Part 80. More stringent requirements may be contained in State Implementation Plans for states which have ozone nonattainment areas. VOC emissions are regulated in these areas to control the formation of ozone pollution. Idaho has no areas legally recognized as nonattainment for ozone.

The applicable requirement for the distributors of gasoline fuel for use in spark ignition engines is set by the latest standard available from the American Society of Testing and Materials (ASTM). The most recent specification is ASTM D4814-95a, which sets the maximum allowable RVP by month throughout the calendar year. This requirement is regulated by Section 37-2906, Idaho Code. The resulting average annual RVP (best case) is approximately 10.9 psia (see Attachment B to review the ASTM volatility schedule and the average annual RVP estimation). The worst case allowable RVP is approximately 12.6 psia.

All of the points listed above were considered in the development of a Tier II OP that would be flexible enough to allow Sinclair to continue daily operations without placing difficult operating requirements in the permit. Without specific information on the actual "worst case" gasoline product's chemical composition, the assumption that the application materials presented a reasonable prediction of the chemical composition was used.

The applicant has stated that there is no truly accurate way for Sinclair to predict the exact HAP concentrations in the gasoline received by the terminal through the supply pipeline. This is because the HAP concentrations vary with differing RVP specifications, as well as with the various refineries producing the gasoline product. At DEQ's request, Sinclair provided a copy of the study used for comparison with the gasoline composition presented in the application (distillate fuel oil HAP composition was based on data from actual analyses).¹

The Radian study contained four types of gasoline that appeared applicable to this project:

- ♦ Winter blend premium;
- ♦ Winter blend regular;
- ♦ Summer blend premium;
- ♦ Summer blend regular.

See Attachment C to review a copy of the comparison of the HAP compositions between the various blends of gasoline and the Sinclair submittal received by DEQ on November 29, 1995. The conclusion drawn from this information is that the study gasolines' liquid state HAP compositions are quite similar to those presented as the application's reference gasoline.

The submitted report, however, does not contain specific information on the RVP of the samples. The allowable range for RVP in gasoline distributed within Idaho is between 9.0 and 15.0 psia. The emission estimates presented in the application are for RVP 10 gasoline throughout the calendar year. Because the goal of this Tier II OP is to establish synthetic minor HAP emission limits for the facility, the overriding concern should be that HAP emissions are adequately represented, and thus, limited by operating requirements related to the parameters affecting HAP emissions.

The best way to identify the potential emissions of HAPs and VOCs would be to have the detailed composition analysis of gasoline products at or near each of the individual RVP limits. The analysis that was employed to establish the allowable emissions is described below.

Loading Rack System

EPA AP-42 Section 5.2 - Transportation and Marketing of Petroleum Liquids, January, 1995, emission factor methodology was used to estimate VOC emissions for the gasoline loading rack. There is a + or - thirty percent (30%) probable error associated with this emission factor. The computer software program TANKS, Version 2.0 (TANKS2), September, 1993, developed by the American Petroleum Institute and EPA, was used to estimate emissions resulting from the storage tank loading, storage, and unloading of the petroleum products. TANKS2 provided the vapor fraction of HAPs present at the climatic conditions for Boise, Idaho, based on chemical composition and physical property data. This information was used to estimate the individual HAP, aggregated HAP, and VOC emissions for the loading rack system. Loading rack operation was assumed to occur for 3760 hours per year.

Upon further review of the TANKS2 results, it appeared that the HAP vapor phase information for the Boise facility loading rack calculations was actually representative of the Burley facility's conditions. Potential emissions calculations performed by DEQ staff predicted that the twenty-five (25) T/yr HAP cap would be exceeded due to an increase of approximately 0.6 T/yr. Therefore, calculations for the loading rack emissions were revised according to the HAP vapor phase information generated by TANKS2 using Boise climatic data.

¹ AB2588 Emissions Estimation Techniques for Petroleum Refineries and Bulk Terminals, July 1989. Radian Corporation.

A comparison between HAP emissions resulting from the following cases was performed using individual months over an entire calendar year:

1. A constant RVP of 10 psia throughout the year (as utilized in the application).
2. A monthly variation in RVP that followed the "best case" or lower allowable RVP according to the applicable standard (ASTM D4814-95a).
3. A constant RVP of 11 psia throughout the year.
4. A constant RVP of 13 psia throughout the year.

The goal of this comparison was to identify which case should be used to determine the allowable aggregated and individual HAP emissions for the Tier II OP. This analysis assumes the HAP concentrations present in the liquid state for each of the four (4) cases are identical (see Attachment D to review the spreadsheets and TANKS2 results).

Because the loading rack emissions dominate the facility's total emissions, it was the only emission source analyzed. An important item to note is that the use of individual month HAP and VOC emissions data predicts a greater amount of annual emissions when compared to the annual method where a single annual average mole fraction for each HAP is used to determine a loading loss factor. The monthly method may be subject to additional rounding error that increased the amount of estimated emissions. Therefore, the values for Case 1 will not match the proposed allowable emission limits in the Tier II OP.

It would seem logical that the greater amount of HAPs would be emitted from a more volatile gasoline since VOC emissions increase as the RVP increases. A summary that includes the two individual HAPs emitted in the greatest amounts, aggregated HAPs, and VOC emissions follows. All other HAPs are predicted to be emitted in lesser quantities, including aggregated meta, ortho, and para xylene isomers (listed in Title III of the Clean Air Act Amendments as Xylenes (isomers and mixtures, CAS #1330207)).

CASE	VOC Emissions (Tons/yr)	Aggregated HAPs Emissions (Tons/yr)	Single HAP Hexane Emissions (Tons/yr)	Single HAP Toluene Emissions (Tons/yr)
Constant RVP = 10 psia	675.11	19.35	6.09	4.45
Variable RVP = ASTM D4814-95a	712.17	19.24	6.02	4.50
Constant RVP = 11 psia	746.30	19.23	6.05	4.46
Constant RVP = 13 psia	858.53	18.49	5.93	4.24

DEQ's analysis results agree with the information provided by Sinclair in their January 10, 1996, submittal. The HAP emissions for a higher RVP gasoline actually are less than for a lower RVP gasoline due to a smaller proportion of HAPs present in the vapor phase of the more volatile, higher RVP cases.

This analysis also provided the justification to not include a Tier II compliance monitoring requirement for Sinclair to monitor the RVP property of the gasoline received and distributed by the facility. This monitoring requirement would have been included in the permit to document that the RVP of the gasoline did not exceed the ten (10) psia annual average used to establish the synthetic minor emission limits and the applicable standard according to Section 37-2506, Idaho Code, which establishes the upper RVP limitation by month throughout the entire calendar year.

In the absence of RVP monitoring, the only monitoring and recordkeeping required for Sinclair to establish compliance with the proposed emission limits and throughputs is the tracking of gasoline and distillate fuel oil types and the amounts. The requirement will apply to all storage tanks except for the "Trans-Mix" Tank which handles residual tank product and waste product, such as oil/water mixtures, ecc., and will apply to the double bay loading rack system.

Petroleum Product Storage Tanks

The TANKS2 software provided the annual individual HAP, aggregated HAP, and VOC emissions for each of the storage tanks. The specification entered into the program were based on the information provided in the application materials. The results are compiled in Attachment A.

Fugitives

New "interim" AP-42 emission factors. August, 1995, for distillate fuel oil, and February 1996, for gasoline (light liquid) approvable by EPA for use in estimating emissions for VOCs (see Attachment E) were used to estimate allowable fugitive VOCs, and thus HAPs. The interim fugitive emission factors are available from EPA on the EPA TTN Bulletin Board system. The emission factor for the process drain was taken from AP-42 Table 9.1-2, 10/1980. No oil/water separators were addressed in the application, and therefore, emissions from such a source are not accounted for in the allowable emissions.

The EPA interim emission factors were used because they are the most current emission factors available for pump seals, valves, and flanges. The application's potential to emit/allowable emissions estimates for the fugitive sources appeared to incorporate a 2000 hour per year assumption when back calculated from emissions and emission factor data. Because the loading rack and storage tank operations were not restricted below 8760 hours per year, the fugitive emissions should reflect the same assumption, unless additional information substantiating a lesser number is received.

The use of EPA's interim emission factors and an increase of 438% (8760 versus 2000 hours per year) resulted in a significant reduction in estimated fugitive VOC and HAP emissions. A 438% increase in fugitive emissions using the application material's emission factors would place this facility's potential to emit aggregated HAPs at greater than 25 tons per year from fugitive emission sources alone.

Emission Estimates Conclusions

The final result of all of the analyses performed is that an increased level of confidence is established. A great number of critical assumptions were incorporated into the analysis. The most important of which is the use of a single HAP composition for gasoline, regardless of actual RVP. The original application contained a potential to emit value that in fact rounds up to twenty-five (25) T/yr with two (2) significant figures. The alteration of a final aggregated HAP potential to emit value based on revised fugitive emission factors reduces the necessity for DEQ to require exact gasoline composition for the permit development.

Allowable throughputs remained as requested in the application, and should allow Sinclair a comfortable degree of operational flexibility and expansion above current actual operations. Had the interim emission factors not been utilized, a reduction in allowable throughputs at the Boise facility would have been required, due to possibly increased HAP emission estimates from the loading rack system.

A review of past DEQ permitting reveals that this analysis is consistent with that performed for Permit to Construct on other gasoline distribution facilities.

Facility allowable annual emissions will be:

POLLUTANT	ALLOWABLE EMISSION (Tons/yr)
Volatile Organic Compounds (VOCs)	685.38
Aggregated Hazardous Air Pollutants (HAPs)	19.51
Individual HAPs:	3.82
Ethylbenzene	0.35
Hexane	6.13
Naphthalene	0.0044
Toluene	3.56
Trimethylpentane 2,2,4 (Iscoctane)	1.43
Xylenes (mixture)	2.29

2. Modeling

No modeling was performed to assess the ambient air quality impacts of this facility.

3. Area Classification

Sinclair's Boise facility is located within the Northern Ada County Nonattainment Area. This facility is located within an area officially designated a "moderate" nonattainment area for carbon monoxide (CO) and particulate matter with a mean aerodynamic diameter of ten (10) microns or less (PM₁₀). This area is designated as either in attainment or unclassifiable for all other criteria air pollutants (NO_x, SO_x, and VOCs).

The facility is located AQCR 64, Zone 11.

4. Facility Classification

The facility is not a designated facility as defined by IDAPA 16.01.01.006.29 of the Rules (petroleum storage capacity of the facility is 9.2 million gallons. Designated facility threshold is 12.5 million gallons storage capacity).

The facility is classified as an A1 source due to permitted VOC emission limits in excess of 100 T/yr. Actual annual VOC emissions also exceed 100 T/yr.

5. Regulatory Review

This OP is subject to the following regulatory requirements:

- | | |
|--|--|
| a. <u>IDAPA 16.01.01.401</u> | Tier II Operating Permit |
| b. <u>IDAPA 16.01.01.403</u> | Permit Requirements for Tier II Sources |
| c. <u>IDAPA 16.01.01.404.01(c)</u> | Opportunity for Public Comment |
| d. <u>IDAPA 16.01.01.404.01(c)(vi)</u> | Consideration of Comments and Final Action |
| e. <u>IDAPA 16.01.01.404.04</u> | Authority to Revise or Renew Operating Permits |
| f. <u>IDAPA 16.01.01.406</u> | Obligation to Comply |
| g. <u>IDAPA 16.01.01.470</u> | Permit Application Fees for Tier II Permits |
| h. <u>IDAPA 16.01.01.650</u> | General Rules for the Control of Fugitive Dust |
| i. <u>IDAPA 16.01.01.723</u> | Sulfur Content Limit for Distillate Fuel Oil |
| j. <u>Section 37-2506, Idaho Code</u> | Quality Standards for Motor Gasoline and Distillate Fuel Oil-Specifications Set By American Society of Testing and Materials |
| k. <u>40 CFR Part 80.27</u> | Controls and Prohibition on Gasoline Volatility |

Sinclair Boise - TECH MEMO
February 13, 1996
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FEES

Fees apply to this facility in accordance with IDAPA 16.01.01.470 of the Rules. The facility is subject to permit application fees for Tier II permits in the amount of five hundred dollars (\$500.00). Sinclair has already submitted this payment to DEQ with the application.

Fees in accordance with IDAPA 16.01.01.525 of the Rules for major facilities that meet the potential to emit requirements of IDAPA 16.01.01.008.14 of the Rules apply to this facility. The amount which Sinclair will have to pay will not be determined until final issuance of the Tier II OP. The issued Tier II OP will establish the allowable VOC emissions, and thereby, the amount of registration fees for the facility.

RECOMMENDATIONS

Based on the review of the Tier II OP application materials and of applicable State of Idaho and federal regulations concerning the permitting of air pollution sources, the Bureau staff recommends that Sinclair Oil Corporation, in Boise, Idaho, be issued a Tier II OP for the sources that exist at the facility. An opportunity for public comment on the air quality aspects of the proposed permit shall be provided as required by IDAPA 16.01.01.404.01 of the Rules. Staff also recommends that the company be notified of the pollutant registration and registration fee requirements pursuant to IDAPA 16.01.01.525 of the Rules in writing.

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cc: Source File
COF
J. Palmer, SWIRO

ATTACHMENT A

DEQ Spreadsheet on Facility Emissions (RVP 10)

Title V Engineer: DM
 Company Name: Sinclair Oil Corp.
 Location: Boise, Idaho
 Date Created: January 4, 1998
 Today's Date: 02/02/98

BOISE, IDAHO FACILITY

Calculation of Loading Rack Emissions

THIS SPREADSHEET IS DESIGNED TO ESTIMATE EMISSIONS BY MONTH

ASSUMPTIONS

1. TANKS2.0 provides the monthly average true vapor pressure of the gasoline product AND the molar fraction of HAP constituents in the vapor phase of the gasoline product.
2. Trimethylpentane 2,2,4 is also known as Iso-octane.
3. Discussions with EPA Region X and the resulting discussions between EPA Region X and Research Triangle Park reveal that gasoline emissions of the three Xylene isomers should be aggregated under a heading of Xylene (mixtures).
4. A comparison between the single "annual" and individual monthly runs of emissions from TANKS2.0 to derive vapor phase HAP and VOC percenta revealed that the rounding of values due to significant figures predicts greater emissions for the detailed monthly run.
5. The most vital assumption made with this analysis is that it assumes an identical chemical composition throughout the year. The most accurate method for estimating all emissions would be to have samples of gasoline chemical composition for EACH of the different Reid Vapor Pressure (RVP) categories. RVP is determined by chemical composition physical properties. Therefore, the acceptance of a single gasoline chemical composition is an important assumption for DEQ to accept. The applicant has further stated that this information would be difficult, if not impossible, to deliver because they may receive gasoline product from refineries other than their own corporation's.

JANUARY

L₁ = 12.46 SPM/T

JANUARY

where L₁ = loading loss, lb/1000 gal
 S = saturation factor, dimensionless, 1.0
 P = true vapor pressure, psia
 M = molecular weight of vapor, lb/lb-mole
 T = absolute temperature, R

JANUARY

L₁ = 12.46 SPM/T
 S = 1.00
 P = 2.83
 M = 66.49
 T = 511.1
 10430.3 E³ gallons

JANUARY Gasoline Throughput, gallons per month, =

JANUARY

HAPs Compounds	Vapor Mass Fraction	L ₁ (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0051	0.0234	0.23
Ethylbenzene	0.0005	0.0023	0.02
Hexane	0.0084	0.0385	0.37
Naphthalene	0.0000	2.73E-06	2.65E-05
Toluene	0.0070	0.0321	0.31
Trimethylpentane (2,2,4)	0.0015	0.0069	0.07
Xylene-m	0.0012	0.0055	0.05
Xylene-o	0.0005	0.0023	0.02
Xylene-p	0.0009	0.0041	0.04
Gasoline (RVP=10)	0.0740	4.4654	43.40
TOTAL			44.62
TOTAL-HAPs ONLY			1.12

EPA AP-42, Section 6.2

FEBRUARY
L₁ = 12.46 SPM/T

FEBRUARY
where L₁ = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

FEBRUARY
L₁ = 12.46 SPM/T
S = 1.00
P = 3.03
M = 66.45
T = 511.1

Gasoline Throughput, gallons per month =
FEBRUARY

19438.3 E³ gallons

HAPs Compounds	Mole Fraction	L ₁ (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0053	0.0260	0.25
Ethylbenzene	0.0005	0.0025	0.02
Hexane	0.0085	0.0417	0.41
Naphthalene	0.0000	2.92E-06	2.84E-05
Toluene	0.0073	0.0358	0.35
Trimethylpentane (2,2,4)	0.0017	0.0083	0.08
Xylene-m	0.0013	0.0064	0.06
Xylene-o	0.0005	0.0025	0.02
Xylene-p	0.0009	0.0044	0.04
Gasoline (RVP-10)	0.9739	4.7786	46.44
TOTAL			47.68
TOTAL-HAPs ONLY			1.24

MARCH
L₁ = 12.46 SPM/T

MARCH
where L₁ = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

MARCH
L₁ = 12.46 SPM/T
S = 1.00
P = 3.22
M = 66.47
T = 511.1

Gasoline Throughput, gallons per month =
MARCH

19438.3 E³ gallons

HAPs Compounds	Mole Fraction	L ₁ (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0054	0.0282	0.27
Ethylbenzene	0.0005	0.0028	0.03
Hexane	0.0087	0.0454	0.44
Naphthalene	0.0000	3.11E-06	3.02E-05
Toluene	0.0076	0.0397	0.39
Trimethylpentane (2,2,4)	0.0019	0.0099	0.10
Xylene-m	0.0013	0.0068	0.07
Xylene-o	0.0006	0.0031	0.03
Xylene-p	0.0010	0.0052	0.05
Gasoline (RVP-10)	0.9730	5.0785	49.36
TOTAL			50.73
TOTAL-HAPs ONLY			1.37

APRIL

 $L_1 = 12.46 \text{ SPM/T}$

APRIL

where L_1 = loading loss, lb/1000 gal S = saturation factor, dimensionless, 1.0 P = true vapor pressure, psia M = molecular weight of vapor, lb/lb-mole T = absolute temperature, °R

AI

 $L_1 =$ see Chart $S =$ see 1.00 $P =$ 3.49 $M =$ 66.60 $T =$ 511.1

Gasoline Throughput, gallons per month =

19438.3 E³ gallons

APRIL

Compounds	IIAPs Mole Fraction	L_1 (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0056	0.0317	0.31
Ethylbenzene	0.0005	0.0028	0.03
Hexane	0.0089	0.0504	0.49
Naphthalene	0.0000	3.37E-06	3.28E-05
Toluene	0.0080	0.0453	0.44
Trimethylpentane (2,2,4)	0.0021	0.0119	0.12
Xylene-m	0.0014	0.0079	0.08
Xylene-o	0.0006	0.0034	0.03
Xylene-p	0.0011	0.0062	0.06
Gasoline (RVP-10)	0.9719	5.5002	53.46
TOTAL			55.01
TOTAL-IIAPS ONLY			1.55

MAY

 $L_1 = 12.46 \text{ SPM/T}$

MAY

where L_1 = loading loss, lb/1000 gal S = saturation factor, dimensionless, 1.0 P = true vapor pressure, psia M = molecular weight of vapor, lb/lb-mole T = absolute temperature, °R

MAY

 $L_1 =$ see Chart $S =$ see 1.00 $P =$ 3.82 $M =$ 66.52 $T =$ 511.1

Gasoline Throughput, gallons per month =

19438.3 E³ gallons

MAY

Compounds	IIAPs Mole Fraction	L_1 (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0058	0.0360	0.35
Ethylbenzene	0.0006	0.0037	0.04
Hexane	0.0092	0.0571	0.55
Naphthalene	0.0000	3.70E-06	3.59E-05
Toluene	0.0084	0.0521	0.51
Trimethylpentane (2,2,4)	0.0023	0.0143	0.14
Xylene-m	0.0015	0.0093	0.09
Xylene-o	0.0006	0.0037	0.04
Xylene-p	0.0011	0.0068	0.07
Gasoline (RVP-10)	0.9706	6.0188	58.51
TOTAL			60.28
TOTAL-IIAPS ONLY			1.78

JUNE
L₁ = 12.46 SPM/T

JUNE
where L₁ = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

JUNE

L₁ = see Chart
S = see 1.00
P = 4.14
M = 66.54
T = 511.1
19438.3 E³ gallons

Gasoline Throughput, gallons per month =
JUNE

HAPs Compounds	Mole Fraction	L ₁ (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0060	0.0403	0.39
Ethylbenzene	0.0008	0.0040	0.04
Hexane	0.0094	0.0631	0.61
Naphthalene	0.0000	4.00E-08	3.89E-05
Toluene	0.0088	0.0591	0.57
Trimethylpentane (2,2,4)	0.0024	0.0161	0.16
Xylene-m	0.0016	0.0107	0.10
Xylene-o	0.0007	0.0047	0.05
Xylene-p	0.0012	0.0081	0.08
Gasoline (RVP-10)	0.9694	6.5094	63.27
TOTAL			65.27
TOTAL--HAPS ONLY			2.00

JULY
L₁ = 12.46 SPM/T

JULY
where L₁ = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

JULY

L₁ = see Chart
S = see 1.00
P = 4.48
M = 66.57
T = 511.1
19438.3 E³ gallons

Gasoline Throughput, gallons per month =
JULY

HAPs Compounds	Mole Fraction	L ₁ (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0062	0.0451	0.44
Ethylbenzene	0.0007	0.0051	0.05
Hexane	0.0096	0.0699	0.68
Naphthalene	0.0000	4.34E-06	4.21E-05
Toluene	0.0091	0.0662	0.64
Trimethylpentane (2,2,4)	0.0026	0.0189	0.18
Xylene-m	0.0017	0.0124	0.12
Xylene-o	0.0007	0.0051	0.05
Xylene-p	0.0013	0.0095	0.09
Gasoline (RVP-10)	0.9682	7.0451	68.47
TOTAL			70.73
TOTAL--HAPS ONLY			2.28

AUGUST

 $L_L = 12.46 \text{ SPM/T}$

AUGUST

where L_L = loading loss, lb/1000 gal S = saturation factor, dimensionless, 1.0 P = true vapor pressure, psia M = molecular weight of vapor, lb/lb-mole T = absolute temperature, °R

AUGUST

 $L_L =$ see Chart $S =$ see 1.00 $P =$ 4.34 $M =$ 68.56 $T =$ 511.1

Gasoline Throughput, gallons per month =

AUGUST

HAPs Compounds	Mole Fraction	L_L (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0061	0.0429	0.42
Ethylbenzene	0.0008	0.0042	0.04
Hexane	0.0095	0.0669	0.66
Naphthalene	0.0000	4.20E-06	4.08E-05
Toluene	0.0090	0.0834	0.62
Trimethylpentane (2,2,4)	0.0025	0.0176	0.17
Xylene-m	0.0018	0.0113	0.11
Xylene-o	0.0007	0.0049	0.05
Xylene-p	0.0012	0.0084	0.08
Gasoline (RVP-10)	0.9667	6.8186	66.27
TOTAL			68.41
TOTAL-HAPs ONLY			2.13

19438.3 E³ gallons

SEPTEMBER

 $L_L = 12.46 \text{ SPM/T}$

SEPTEMBER

where L_L = loading loss, lb/1000 gal S = saturation factor, dimensionless, 1.0 P = true vapor pressure, psia M = molecular weight of vapor, lb/lb-mole T = absolute temperature, °R

SEPTEMBER

 $L_L =$ see Chart $S =$ see 1.00 $P =$ 3.97 $M =$ 68.53 $T =$ 511.1

Gasoline Throughput, gallons per month =

SEPTEMBER

HAPs Compounds	Mole Fraction	L_L (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0059	0.0380	0.37
Ethylbenzene	0.0008	0.0039	0.04
Hexane	0.0093	0.0598	0.58
Naphthalene	0.0000	3.83E-06	3.73E-05
Toluene	0.0085	0.0547	0.53
Trimethylpentane (2,2,4)	0.0023	0.0148	0.14
Xylene-m	0.0015	0.0096	0.09
Xylene-o	0.0007	0.0045	0.04
Xylene-p	0.0012	0.0077	0.08
Gasoline (RVP-10)	0.9700	6.2398	60.64
TOTAL			62.52
TOTAL-HAPs ONLY			1.88

19438.3 E³ gallons

OCTOBER

L_L = 12.46 SPM/T

OCTOBER

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

OCTOBER

L_L = see Chart
 S = see 1.00
 P = 3.53
 M = 66.50
 T = 511.1

Gasoline Throughput, gallons per month, =

OCTOBER

HAPs Compounds	Mole Fraction	L _L (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0058	0.0320	0.31
Ethylbenzene	0.0005	0.0029	0.03
Hexane	0.0080	0.0515	0.50
Naphthalene	0.0000	3.41E-06	3.31E-05
Toluene	0.0080	0.0457	0.44
Trimethylpentane (2,2,4)	0.0021	0.0120	0.12
Xylene-m	0.0014	0.0080	0.08
Xylene-o	0.0008	0.0034	0.03
Xylene-p	0.0011	0.0063	0.06
Gasoline (RVP-10)	0.9717	5.5567	54.01
TOTAL			55.58
TOTAL-HAPs ONLY			1.57

19438.3 E³ gallons

NOVEMBER

L_L = 12.46 SPM/T

NOVEMBER

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

NOVEMBER

L_L = see Chart
 S = see 1.00
 P = 3.11
 M = 66.48
 T = 511.1

Gasoline Throughput, gallons per month, =

NOVEMBER

HAPs Compounds	Mole Fraction	L _L (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0053	0.0267	0.26
Ethylbenzene	0.0005	0.0025	0.02
Hexane	0.0088	0.0434	0.42
Naphthalene	0.0000	3.01E-06	2.92E-05
Toluene	0.0075	0.0378	0.37
Trimethylpentane (2,2,4)	0.0018	0.0091	0.09
Xylene-m	0.0013	0.0066	0.06
Xylene-o	0.0005	0.0025	0.02
Xylene-p	0.0010	0.0050	0.05
Gasoline (RVP-10)	0.9735	4.9119	47.74
TOTAL			49.04
TOTAL-HAPs ONLY			1.30

19438.3 E³ gallons

DECEMBER
L = 12.46 SPM/T

DECEMBER
where L = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

CHLORINE	1.00
PROPANE	2.88
METHANE	60.41
ETHYLENE	51.1
1,2-DICHLOROETHANE	19438.9

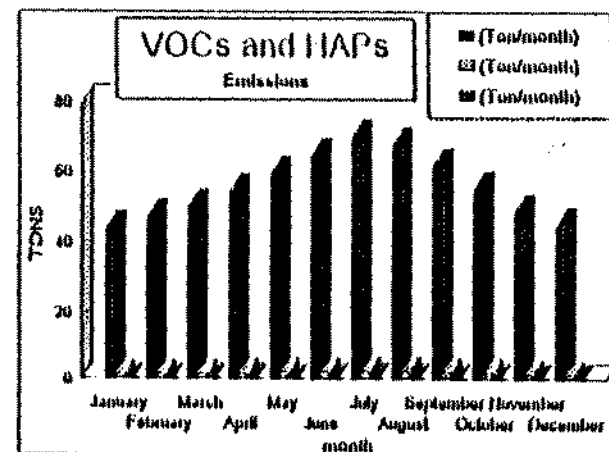
Gasoline Throughput, gallons per month =
DECEMBER

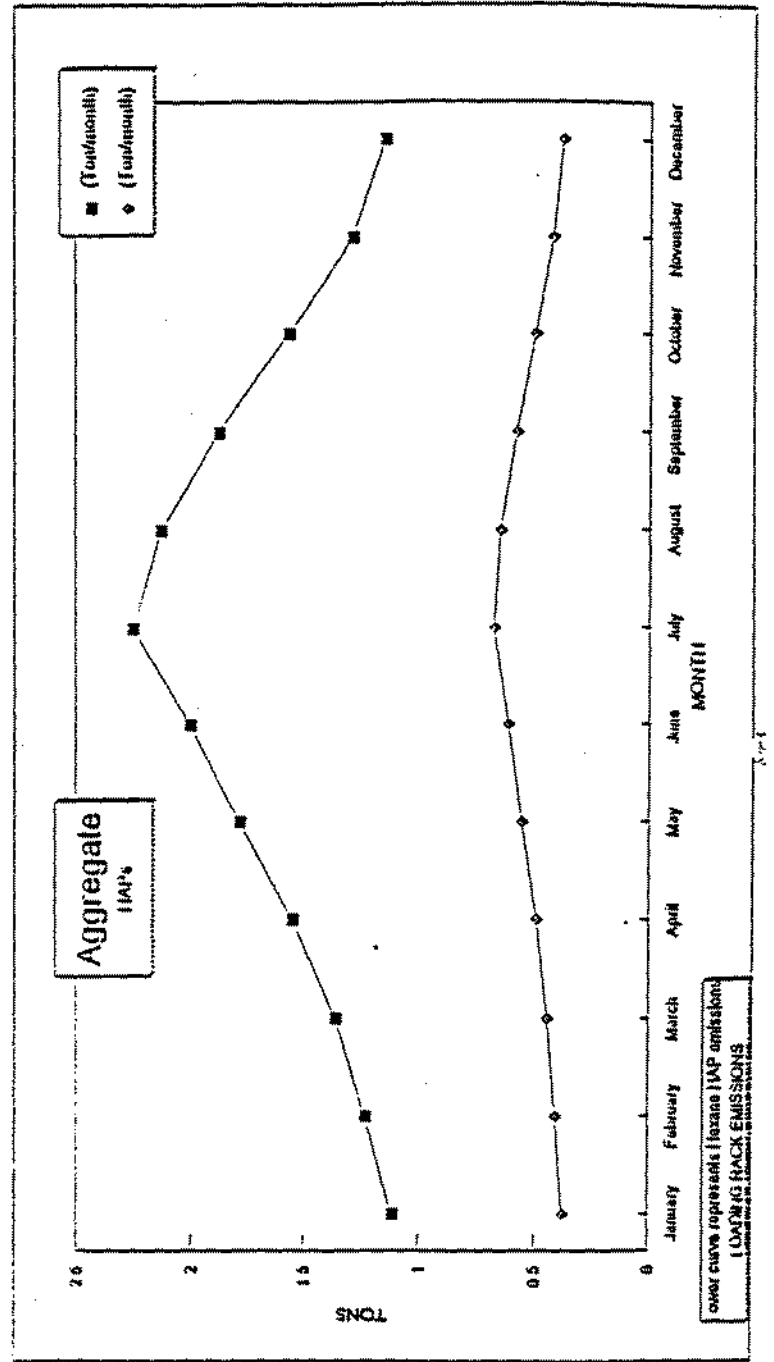
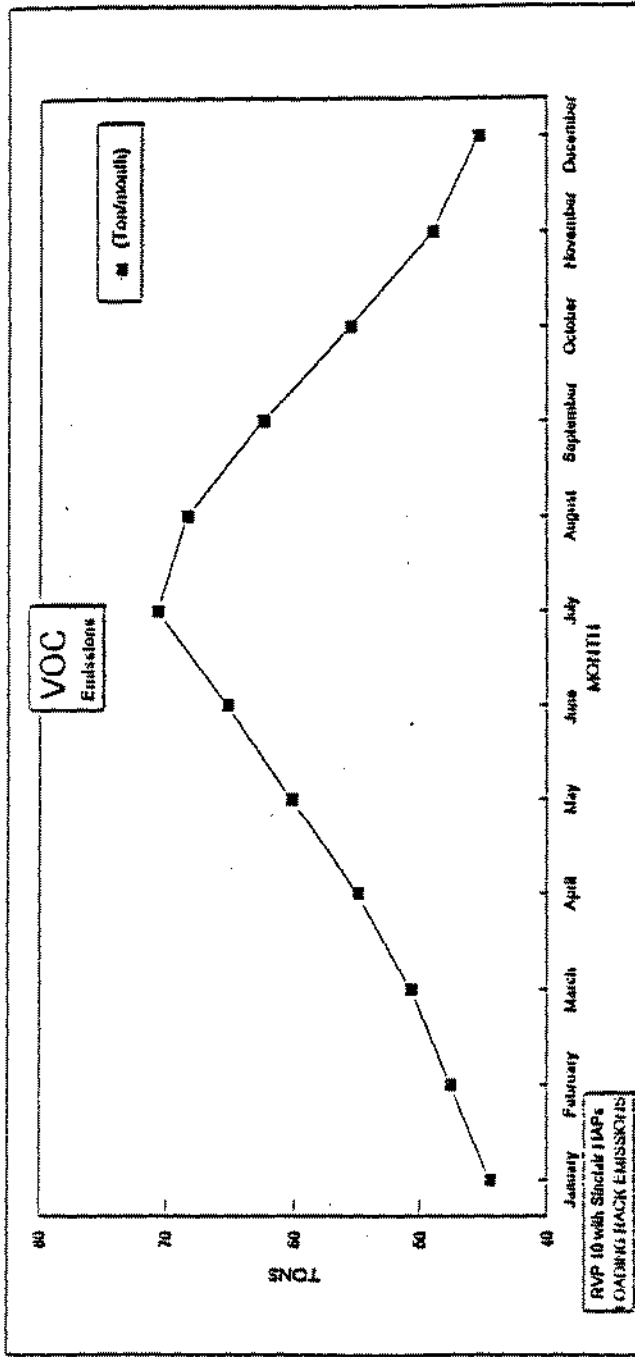
HAPs Compounds	Mole Fraction	L (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0052	0.0243	0.24
Ethylbenzene	0.0005	0.0023	0.02
Hexane	0.0084	0.0392	0.38
Naphthalene	0.0000	2.78E-06	2.70E-05
Toluene	0.0071	0.0331	0.32
Trimethylpentane (2,2,4)	0.0016	0.0075	0.07
Xylene-m	0.0012	0.0056	0.05
Xylene-o	0.0005	0.0023	0.02
Xylene-p	0.0009	0.0042	0.04
Gasoline (RVP-10)	0.9746	4.5469	44.18
TOTAL			45.34
TOTAL-HAPs ONLY			1.19

ANNUAL LOADING RACK EMISSIONS (RVP 10 with Sinclair HAPs)

VOC Emissions (Ton/yr)	Aggreg HAP Emissions (Ton/yr)	Single HAP Hexane Emiss (Ton/yr)	Single HAP Toluene (Ton/yr)
675.11	19.35	6.09	4.45

	Aggregate HAPs (Ton/month)	Hexane Emissions (Ton/month)	VOC Emissions (Ton/month)
January	1.12	0.37	44.52
February	1.24	0.41	47.68
March	1.37	0.44	50.73
April	1.55	0.49	55.01
May	1.78	0.55	60.28
June	2.00	0.61	65.27
July	2.26	0.68	70.73
August	2.13	0.65	68.41
September	1.88	0.58	62.52
October	1.67	0.50	55.58
November	1.30	0.42	49.04
December	1.15	0.38	45.34





ANNUAL AVERAGE VAPOR PHASE HAP FRACTION METHOD:

Notes and concerns:

1. The Sinclair submittal for the Boise facility contained HAP and VOC vapor phase emission estimates that appear to be applicable for the Butley facility. The overall ambient climate conditions are colder for Butley and thus, this results in the underestimation of emissions from the loading rack. Because the requested throughputs place Sinclair's potential to emit AT the MACT standard applicability threshold of 25 tons per year aggregated HAPs, either the requested throughputs must decrease slightly or a change in the estimation methodology for some emission sources must be altered to reduce the facility-wide cap for allowable emissions. I.e. DEQ's additional 0.60 TPY aggreg. HAP emissions exceeded the 25 tpy cap.
2. EPA has recently made available revised Interim emission factors to estimate fugitive emissions from Marketing terminals. The document is titled New Equipment Leak Emission Factors for Petroleum Refineries, Gasoline Marketing, and Oil & Gas Production Operations, February 1995. These emission factors are presented both for the screening method (where a known concentration of VOCs is emitted) and the "average" emission factor method, which requires no monitoring data). The "average" emission factor method is to be used just as in the applicant's submittal. These 1995 emission factors will replace the applicant's emission estimates that employed EPA AP-42 emission factors published in 1980.
3. EPA AP-42 Section 5.2 - Transportation and Marketing of Petroleum Products, January, 1995. This relationship was used to estimate annual VOC and HAP loading rack emissions. The document states that it has within a + or - 30 percent probable error.

ANNUAL LOADING RACK EMISSIONS using an ANNUAL AVERAGE MOLE FRACTION GASOLINE SERVICE

L_L = 12.48 SPM/T

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure of liquid delivered, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute bulk liquid temperature, °R

L _L =	see Chart
S =	1.00
P =	3.54
M =	68.60
T =	511.1

ANNUAL Gasoline Throughput, gallons per year =

ANNUAL

233260.0 E³ gallons

HAPs Compounds	Mole Fraction	L _L (lb/10 ³ gal)	Emissions (Ton/YEAR)
Benzene	0.0058	0.0321	3.75
Ethylbenzene	0.0005	0.0029	0.33
Hexane	0.0090	0.0516	6.02
Naphthalene	0.0000	3.42E-06	3.99E-04
Toluene	0.0080	0.0459	5.35
Trimethylpentane (2,2,4)	0.0021	0.0120	1.40
Xylene-m	0.0014	0.0080	0.94
Xylene-o	0.0008	0.0034	0.40
Xylene-p	0.0011	0.0063	0.74
Gasoline (RVP-10)	0.9717	5.5741	650.11

XYLENE (mixture)
2.07 tons per year

TOTAL 669.04
TOTAL-HAPs ONLY 16.93

HAPs ≥ than Shetair submittal
0.68 TPY

DISTILLATE FUEL OIL SERVICE

L_L = 12.48 SPM/T

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure of liquid delivered, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute bulk liquid temperature, °R

L _L =	see Chart
S =	1.00
P =	0.0053
M =	129.04
T =	511.1

ANNUAL Distillate Fuel Oil Throughput, gallons per year =

ANNUAL

337260.0 E³ gallons

HAPs Compounds	Mole Fraction	L _L (lb/10 ³ gal)	Emissions (Ton/YEAR)
Naphthalene	0.0005	8.34E-06	0.001
Toluene	0.0102	0.0002	0.029
Xylene-m	0.0115	0.0002	0.032
Xylene-o	0.0031	0.0001	0.009
Xylene-p	0.0000	0.0000	0.000
Distillate Fuel Oil #2	0.9747	0.0163	2.740
TOTAL	1.0000		2.811
TOTAL-HAPs ONLY			0.071

XYLENE (mixture)
0.04 tons per year

TYPICAL STORAGE TANK EMISSIONS

Emissions are estimated using TANKS2 and are for a SINGLE tank, except as noted.

Storage tank emissions are comprised of: Withdrawal, roof-fitting, rim-seal, and standing losses.

Gasoline Storage Tanks

Tanks 401, 404, 411, 421

HAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Benzene	0.0030	0.0131
Ethylbenzene	0.0007	0.0030
Hexane	0.0045	0.0188
Naphthalene	0.0000	0.0001
Toluene	0.0057	0.0251
Trimethylpentane (2,2,4)	0.0013	0.0056
Xylene-m	0.0016	0.0069
Xylene-o	0.0010	0.0044
Xylene-p	0.0014	0.0062
Gasoline (RVP-10)	0.4639	2.0320
TOTAL VOCs	0.483	2.116
TOTAL-HAPs ONLY	0.019	0.084

Tank 431

HAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Benzene	0.0028	0.0124
Ethylbenzene	0.0005	0.0021
Hexane	0.0044	0.0182
Naphthalene	0.0000	0.0001
Toluene	0.0048	0.0212
Trimethylpenta	0.0011	0.0050
Xylene-m	0.0012	0.0051
Xylene-o	0.0007	0.0030
Xylene-p	0.0010	0.0044
Gasoline (RVP)	0.4614	2.0208
TOTAL VOCs	0.4779	2.0933
TOTAL-HAPs	0.0166	0.0725

For the four (4) Tanks:

TOTAL VOCs	1.033	8.465
TOTAL-HAPs ONLY	0.077	0.337

Tanks Transmix and Prover

Emissions are nearly identical (per applicant's submittal) to each other so the Transmix Tank results will be used for both tanks.

HAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Benzene	0.0003	0.0012
Ethylbenzene	0.0000	0.0001
Hexane	0.0004	0.0010
Naphthalene	0.0000	0.0000
Toluene	0.0001	0.0003
Trimethylpentane (2,2,4)	0.0001	0.0005
Xylene-m	0.0001	0.0003
Xylene-o	0.0000	0.0001
Xylene-p	0.0001	0.0002
Gasoline (RVP-10)	0.0478	0.2093
TOTAL VOCs	0.0488	0.2138
TOTAL-HAPs ONLY	0.0011	0.0047

For the two (2) Tanks:

TOTAL VOCs	0.0977	0.4279
TOTAL-HAPs ONLY	0.0021	0.0094

DISTILLATE FUEL OIL STORAGE TANKS

TANKS 402, 405, 406

IIAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Naphthalene	0.0001	0.0003
Toluene	0.0011	0.0049
Xylene m	0.0013	0.0057
Xylene-o	0.0004	0.0015
Distillate Fuel Oil #2	0.1085	0.4752
TOTAL VOCs	0.1113	0.4876
TOTAL--IIAPS ONLY	0.0028	0.0124

For the three (3) Tanks:

TOTAL VOCs	0.3340	1.4628
TOTAL--IIAPS ONLY	0.0085	0.0371

STORAGE TANK SUMMARY

IIAPs Compounds	Hourly Emissions (lb/hr)	Annual Emissions (Ton/YEAR)
Benzene	0.0153	0.0672
Ethylbenzene	0.0033	0.0143
Hexane	0.0234	0.1023
Naphthalene	0.0003	0.0014
Toluene	0.0312	0.1368
Trimethylpentane (2,2,4)	0.0065	0.0284
Xylene-m	0.0115	0.0504
Xylene-o	0.0058	0.0253
Xylene-p	0.0068	0.0297
Gasoline OR Fuel Oil	2.7381	11.9829
TOTAL VOCs	2.8422	12.4487
TOTAL--IIAPS ONLY	0.1041	0.4558

Xylenes (mixture) 0.1055 Tons/yr

FUGITIVE HAP EMISSIONS (Gasoline Service)

HAP Component	Liquid Mass Fraction	VOC Emts Rate (lb/hr)	HAP Emission Rate (lb/hr)	VOC emts Rate (Tons/year)	HAP Emission Rate (Tons/year)
Benzene	0.0188	0.0017	0.0017	0.0076	0.0076
Ethylbenzene	0.0207	0.0019	0.0019	0.0083	0.0083
Hexane	0.0181	0.0017	0.0017	0.0073	0.0073
Naphthalene	0.0013	0.0001	0.0001	0.0005	0.0005
Toluene	0.0972	0.0090	0.0090	0.0392	0.0392
Trimethylpentane 2,2,4	0.0151	0.0014	0.0014	0.0061	0.0061
Xylene (-m)	0.0448	0.0041	0.0041	0.0181	0.0181
Xylene (-o)	0.0349	0.0032	0.0032	0.0141	0.0141
Xylene (-p)	0.0448	0.0041	0.0041	0.0181	0.0181
Gasoline (RVP 10)	0.7043	0.0649	0.0000	0.2841	0.0000
Totals:	1.0000	0.0921	0.0272	0.403	0.119

FUGITIVE HAP EMISSIONS (Distillate Fuel Oil Service)

HAP Component	Liquid Mass Fraction	VOC Emts Rate (lb/hr)	HAP Emission Rate (lb/hr)	VOC Emts Rate (Tons/year)	HAP Emission Rate (Tons/year)
Benzene	0.000028	0.000004	0.000004	0.000019	0.000019
Naphthalene	0.001700	0.000260	0.000260	0.001139	0.001139
Toluene	0.000200	0.000031	0.000031	0.000134	0.000134
Xylene (-m)	0.000300	0.000046	0.000046	0.000201	0.000201
Xylene (-o)	0.000600	0.000092	0.000092	0.000402	0.000402
Xylene (-p)	0.000000	0.000000	0.000000	0.000000	0.000000
Distillate Fuel Oil #2	0.997172	0.152567	0.000000	0.668242	0.000000
Totals:	1.0000	0.1530	0.00043	0.6701	0.0019

FUGITIVE EMISSIONS

The estimate of fugitive emissions is based on the information provided by the applicant and newly revised "interim" AP-42 emission factors.

Notes and Comments:

1. Sinclair submittal appears to assume that fugitive emissions occur for 2000 hours per year. If emissions from these sources occur for 8760 hours per year, then the a linear ramping of emissions would predict HAP emissions of > 25 TPY for fugitive sources alone. This would mean that since all point and fugitive HAP emissions must be accounted for in applicability for a major HAP source, that a Tier II synthetic minor option is not an option for Sinclair's facilities. Therefore, this analysis will incorporate the newest AP-42 emission factors available and an assumption of 8760 hours per year. No additional documentation on the 2000 hour/year assumption was listed in the application.
2. The number of emissions sources is provided by the applicant.

SOURCE	# of Sources	Emission Factor (lb/hr/source)	Total VOC Emissions (lb/hr)	Assumed Hours/yr Operation	Total VOC Emissions (Tons/year)
GASOLINE (light liquid):					
Pump Seals	7	1.2E-03	0.008	8760	0.037
Valves	103	9.5E-05	0.010	8760	0.043
Flanges	230	1.7E-05	0.004	8760	0.017
Process Drains *1	1	0.07	0.070	8760	0.307
Oil/Water Separator	0		0.000	8760	0.000
		Lb/hr totals:	0.092	Ton/yr total:	0.403
DISTILLATE FUEL OIL (heavy liquid) *2					
Pump Seals	4	2.9E-02	0.115	8760	0.502
Valves	58	5.5E-05	0.003	8760	0.014
Flanges	145	2.4E-04	0.035	8760	0.154
Process Drains *1	0	0.07	0.000	8760	0.000
Oil/Water Separator	0		0.000	8760	0.000
		Lb/hr totals:	0.153	Ton/yr total:	0.670
Fugitive Grand Total (0.25 lb/hr		1.07 Ton/yr

*1 Emission factor for the drain is from AP-42 Table 9.1-2 Fugitive Emission Factors for Petroleum Refineries, October/1980

*2 Distillate fuel oil emission factors are from the August 1995 AP-42 Interim Emission Factors for Oil and Gas Production Operations

HAP Emissions = VOC Emission Rate * HAP Liquid Mass Fraction

Emissions and Allowable Throughput Summary - Boise, Idaho Facility

SOURCE IDENTIFICATION	ALLOWABLE EMISSIONS				ALLOWABLE THROUGHPUT		Allowable Product Type
	Volatile Organic Compounds		Aggregated Hazardous Air Pollutants		(Gallons/day)	(Gallons/yr)	
	(lb/hr)	(Tons/yr)	(lb/hr)	(Tons/yr)			
STORAGE TANKS							
Tank 401	0.48	2.12	0.019	0.084	N/A	58,254,000	Gasoline
Tank 404	0.48	2.12	0.019	0.084	N/A	58,254,000	Gasoline
Tank 411	0.48	2.12	0.019	0.084	N/A	58,254,000	Gasoline
Tank 421	0.48	2.12	0.019	0.084	N/A	58,254,000	Gasoline
Tank 431	0.48	2.09	0.017	0.073	N/A	58,254,000	Gasoline
	2.41	10.56	0.09	0.41			
Tank 402	0.11	0.49	0.003	0.012	N/A	168,630,000	Distillate Fuel Oil
Tank 405	0.11	0.49	0.003	0.012	N/A	168,630,000	Distillate Fuel Oil
Tank 408	0.11	0.49	0.003	0.012	N/A	168,630,000	Distillate Fuel Oil
	0.33	1.46	0.01	0.04			
Transmix Tank 400	0.05	0.21	0.001	0.005	N/A	38,080	Gasoline
Prover Tank	0.05	0.21	0.001	0.005	N/A	220,200	Gasoline
	0.10	0.43	0.002	0.009			
LOADING RACK							
Gasoline Service	152.75	669.04	4.32	18.93	638,400	233,016,000	Gasoline
Distillate Fuel Oil Service	0.64	2.81	0.0004	0.002	924,000	337,260,000	Distillate Fuel Oil
	153.39	671.85	4.32	18.94			
FUGITIVES							
Gasoline Service	0.092	0.403	0.027	0.119	N/A	N/A	
Distillate Fuel Oil Service	0.153	0.670	0.0001	0.002	N/A	N/A	
	0.245	1.074	0.028	0.121			
Total Emissions:	156.48	685.37	4.46	19.51			

Notes:

N/A stands for Not Applicable

Annual storage tank emissions are derived from the EPA/API TANKS2.0 program.

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

11/22/95
PAGE 1

Identification:
Identification No.: Tank 401
City: Boise
State: ID
Company: Sinclair Oil Corporation
Type of Tank: External Floating Roof

Tank Dimensions
Diameter (ft): 60
Volume(gallons): 839400
Turnovers: 69

Paint Characteristics
Shell Condition: Light Rust
Shell Color/Shader: White/White
Shell Paint Condition: Good

Roof Characteristics
Roof Type: Double Deck
Fitting Category: Typical

Tank Construction and Rim-Seal System
Construction: Welded
Primary Seal: Mechanical Shoe
Secondary Seal: Rim-mounted

Roof Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Unstotted Guide-Pole Well/Ungasketed Sliding Cover	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

Meteorological Data Used in Emission Calculations: Boise, Idaho

NOTE: THIS IS THE SAME REPORT AS FOR TANKS:

#404

#411

#421

~~#431~~ (431 is a different tank size).

NOTE: WILL NOT PRINT OUT 69.4 TURNOVERS PER YE.

$$\left(\frac{69.4 \text{ TURNOVER}}{\text{YEAR}} \right) \left(\frac{839,400 \text{ Gal}}{\text{Tank}} \right) = 58,254,362$$

$$\Rightarrow 58,250,000 \frac{\text{Gallons}}{\text{YEAR}} \text{ EACH TANK}$$

TANKS 1. JAN 2, 0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK

Mixture/Component	Daily Liquid Surf. Temp.		Bulk Temp.		Vapor Pressures (psia)		Vapor Weight	Liquid Mass Fract.	Vapor Mass Fract.	Basis for Vapor Pressure Weight Calculations	
	Temperatures (deg F)		Temp.		Pressures (psia)					Mol.	Weight
	Month	Avg.	Min.	Max.	Avg.	Min.					
Gasoline RVP10 With HAPs	All	53.12	47.11	59.13	51.12	3.5387	N/A	N/A	66.499		
Benzene						0.9620	N/A	N/A		Option 2: A=6.9050, B=1211.033, C=220.790	
Ethylbenzene						0.0851	N/A	N/A		Option 2: A=6.9750, B=1424.255, C=213.210	
Gasoline (RVP 10)						4.4434	N/A	N/A		Option 4: RVP=10.00, ASH Slope=2.5	
Hexane (-n)						1.5952	N/A	N/A		Option 2: A=6.8760, B=1171.170, C=224.410	
Isooctane						0.4472	N/A	N/A		Option 1	
Methylcyclohexane C-10 H-8						0.0017	N/A	N/A		Option 2: A=7.1463, B=1831.571, C=211.021	
Toluene						0.2655	N/A	N/A		Option 2: A=6.9540, B=1344.800, C=219.680	
Xylene (-m)						0.1018	N/A	N/A		Option 2: A=7.0890, B=1426.266, C=215.110	
Xylene (-o)						0.0553	N/A	N/A		Option 2: A=6.9980, B=1474.679, C=213.690	
Xylene (-p) or Para-Xylene						0.0763	N/A	N/A		Option 2: A=7.0206, B=1474.403, C=217.773	

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
DETAIL CALCULATIONS (AP-42)

11/22/95
PAGE 3

Annual Emission Calculations

Rim Seal Losses (lb): 482.7069
Seal Factor (lb-mole/ft yr (mph)ⁿ): 0.2000
Average Wind Speed (mph): 8.8
Seal-related Wind Speed Exponent: 1.00
Value of Vapor Pressure function: 0.0687
Vapor Pressure at Daily Average Liquid
Surface Temperature (psia): 3.538675
Tank Diameter (ft): 60
Vapor Molecular Weight (lb/lb-mole): 66.498576
Product factor: 1.0000

Withdrawal Losses (lb): 181.5639
Annual Net Throughput (gal/yr): 58254360
Shell Clingage Factor (bbl/1000 sqft): 0.0015
Average Organic Liquid Density (lb/gal): 0.0000
Tank Diameter (ft): 60

Roof Fitting Losses (lb): 3568.2285
Value of Vapor Pressure function: 0.0687
Vapor Molecular Weight (lb/lb-mole): 66.498576
Product factor: 1.0000
Tot. Roof Fitting Loss Fact. (lb-mole/yr): 780.6081
Average Wind Speed (mph): 8.8

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors		
		KFa (lb-mole/yr)	Kfb (lb-mole/(yr mph ⁿ))	n
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1	1.20	0.17	1.00
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	0.00	67.00	0.98
Roof Lay (3-in. Diameter)/Adjustable, Double-Deck Roofs	10	0.25	0.07	1.00
Roof Drain (3-in. Diameter)/Open	1	0.00	7.00	1.40
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1	0.95	0.14	1.00
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1	2.30	5.90	1.00
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	0.00	0.00	0.00

Total Losses (lb): 4232.50

TANKS ...GRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

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Annual Emissions Report

Liquid Contents	Losses (lbs.):			Total Standing	Total
	Total Withdrawal	Roof-fitting	Rim-Seal		
Gasoline RVP10 With HAPs	181.56	3568.23	482.71	4050.94	4232.50
Benzene	3.41	20.03	2.71	22.74	26.16
Ethylbenzene	3.76	1.95	0.26	2.21	5.97
Gasoline (RVP 10)	127.88	3467.21	469.04	3936.25	4064.13
Hexane (-n)	3.29	31.98	4.33	36.31	39.60
Isooctane	2.74	7.48	1.01	8.49	11.23
Naphthalene C-10 H-8	0.24	0.00	0.00	0.00	0.24
Toluene	17.65	28.59	3.87	32.46	50.10
Xylene (-m)	8.13	5.05	0.68	5.74	13.87
Xylene (-o)	6.34	2.14	0.29	2.43	8.76
Xylene (-p) or Para-Xylene	8.13	3.79	0.51	4.30	12.43
Total:	181.56	3568.23	482.71	4050.94	4232.50

P WITH SINCLAIR'S VALUES.

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

01/25/96
PAGE 1

Identification

Identification No.: 301
City: Burley
State: ID
Company: Sinclair Oil Corp.
Type of Tank: External Floating Roof

Tank Dimensions

Diameter (ft): 60
Volume(gallons): 818437
Turnovers: 103

Paint Characteristics

Shell Condition: Light Rust
Shell Color/Shade: White/White
Shell Paint Condition: Good

Roof Characteristics

Roof Type: Double Deck
Fitting Category: Typical

Tank Construction and Rim-Seal System

Construction: Welded
Primary Seal: Mechanical Shoe
Secondary Seal: Rim-mounted

Roof Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

Meteorological Data Used in Emission Calculations: Pocatello, Idaho

ATTACHEMENT C

Spreadsheet on Radian Corporation Gasoline Study

Sinclair Oil Corporation Boise and Burley Tier II's

RADIAN STUDY ON GASOLINE COMPOSITION

Gasoline Constituents:	HAPs present in UNLEADED gasoline (Oliver and Peoples, 1985 Study) (WEIGHT %)								
	Benzene	Ethylbenzene	Hexane	Isooctane	Naphthalene	Toluene	Xylene(-m)	Xylene(-o)	Xylene(-p)
Summer Regular	1.93	2.05	1.95	3.01	0	10.32	4.58	3.39	4.58
Summer Premium	2.15	2.1	1.23	6.8	0	14.22	4.72	3.69	4.72
Winter Regular	1.82	2.08	1.66	0	0.25	9.11	4.375	3.59	4.375
Winter Premium	2.07	2.14	1.14	0	0.21	12.92	4.8	3.66	4.8
Summer Blends Average	2.04	2.075	1.59	4.905	0	12.27	4.65	3.54	4.65
Winter Blends Average	1.945	2.11	1.4	0	0.23	11.015	4.5875	3.625	4.5875
% Change in HAP concent. (winter with summer as base)	-4.66	1.69	-11.95	-100.00	ERR	-10.23	-1.34	2.40	-1.34
Regular Average	1.875	2.065	1.805	1.505	0.125	9.715	4.4775	3.49	4.4775
Premium Average	2.11	2.12	1.185	3.4	0.105	13.57	4.76	3.675	4.76
Total Average Value	1.99	2.09	1.50	2.45	0.12	11.64	4.62	3.58	4.62

Unincluded HAP from Study

Cumene (Isopropylbenzene)	
Summer Regular	0.19
Summer Premium	0.17
Winter Regular	0.25
Winter Premium	0.19
Total Average Value	0.2

EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

PAGE 4

Annual Emissions Report

Liquid Contents	Losses (lbs.):				Total	
	Total	Withdrawal	Roof-Fitting	Rim-Seal	Standing	Total
Gasoline (RVP 10) w/ Sinclair	269.16	3751.46		503.48	4254.94	4524.09
Benzene	5.06	20.31		2.73	23.03	28.10
Ethylbenzene	5.57	1.91		0.26	2.17	7.74
Gasoline (RVP 10)	189.57	3650.23		489.89	4140.12	4329.69
Hexane (n)	4.87	32.69		4.39	37.07	41.95
Isooctane	4.06	7.02		0.94	7.96	12.02
Naphthalene C-10, H-8	0.35	0.00		0.00	0.00	0.35
Toluene	26.16	28.53		3.83	32.35	58.52
Xylene (m)	12.06	4.97		0.67	5.64	17.69
Xylene (o)	9.39	2.09		0.28	2.37	11.76
Xylene (p) "paraxylene"	12.06	3.72		0.50	4.22	16.28
Total:	269.16	3751.46		503.48	4254.94	4524.09

ATTACHMENT B

ASTM D4814-95a Standard Specification and
Average Annual Allowable RVP Requirement

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK

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PAGE 2

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)		Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight Calculations	
		Avg.	Min.	Max.	Avg.	Min.	Avg.	Min.	Max.					
Gasoline (KVP 10) w/ Sinclair	All	48.66	42.21	55.11	46.62		3.2269	N/A	N/A	66.472				
Benzene							0.8454	N/A	N/A		0.0188	0.0054	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene							0.0723	N/A	N/A		0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Gasoline (KVP 10)							4.0560	N/A	N/A		0.7043	0.9730	66.00	Option 4: KVP=10.00, ASTM Slope=2.5
Hexane (-n)							1.4133	N/A	N/A		0.0181	0.0067	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane							0.3637	N/A	N/A		0.0151	0.0019	114.22	Option 1
Naphthalene C-10, H-8							0.0014	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene							0.2297	N/A	N/A		0.0972	0.0076	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)							0.0868	N/A	N/A		0.0448	0.0013	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)							0.0468	N/A	N/A		0.0349	0.0006	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"							0.0650	N/A	N/A		0.0448	0.0010	106.16	Option 2: A=7.0206, B=1474.403, C=217.773

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
DETAIL CALCULATIONS (AP-42)

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PAGE 3

Annual Emission Calculations

Rim Seal Losses (lb): 503.4772
Seal Factor (lb-mole/ft yr (mph)ⁿ): 0.2000
Average Wind Speed (mph): 10.2
Seal-related Wind Speed Exponent: 1.00
Value of Vapor Pressure Function: 0.0619
Vapor Pressure at Daily Average Liquid Surface Temperature (psia): 3.226885
Tank Diameter (ft): 60
Vapor Molecular Weight (lb/lb-mole): 66.472271
Product Factor: 1.0000

Withdrawal Losses (lb): 269.1584
Annual Net Throughput (gal/yr): 86359011
Shell Clingage Factor (bbt/1000 sqft): 0.0015
Average Organic Liquid Density (lb/gal): 0.0000
Tank Diameter (ft): 60

Roof Fitting Losses (lb): 3751.4586
Value of Vapor Pressure Function: 0.0619
Vapor Molecular Weight (lb/lb-mole): 66.472271
Product Factor: 1.0000
Tot. Roof Fitting Loss Fact. (lb-mole/yr): 912.0145
Average Wind Speed (mph): 10.2

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors		
		Kfa (lb-mole/yr)	Kfb (lb-mole/(yr mph ⁿ))	m
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1	1.20	0.17	1.00
Unlotted Guide-Pole Well/Ungasketed Sliding Cover	1	0.00	67.00	0.98
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10	0.25	0.07	1.00
Roof Drain (3-in. Diameter)/Open	1	0.00	7.00	1.40
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1	0.95	0.14	1.00
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1	2.30	5.90	1.00
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	0.00	0.00	0.00

Total Losses (lb): 4524.09

TABLE 4 Schedule of Seasonal and Geographical Volatility Classes^a

This schedule, subject to agreement between purchaser and seller, denotes the volatility properties of the fuel at the time and place of delivery to the end user. It also denotes the vapor pressure for treated gasoline coverage at refineries, importers, processors, and terminals during May and for the entire distribution system for June 1 to Sept. 15. Shipments should approximate this schedule.

Where alternative classes are listed, either class or intermediate classes are acceptable; the option must be exercised by the seller.

State	Jan.	Feb.	Mar.	Apr.	May ^d	June	July	Aug.	Sept. 1-15	Sept. 16-30	Oct.	Nov.	Dec.
Alabama	E-4	C-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-2 ^e	A-2 ^e	A-2/C-3	C-3	C-3/C-4	C-4
Alaska	E-5	E-5	E-5	E-5	E-5/C-4	C-4	C-4	C-4	C-4	C-4/E-5	E-5	E-5	E-5
Arizona													
N 34° Latitude	C-4	C-4	C-4/C-3	C-3/A-2	A-2 (E-2)	A-1	A-1	A-1	A-2	A-2/E-2	E-2/C-3	C-3/C-4	C-4
and E 111°													
Longitude													
Remainder of	C-4	C-4/C-3	C-3/B-2	B-2/A-2	A-2 (E-2)	A-1 ^e	A-1 ^e	A-1 ^e	A-1 ^e	A-1	A-1/E-2	E-2/C-3	C-3/C-4
States													
Arkansas	E-5/D-4	C-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-3	A-2	A-2	A-2	A-2/C-3	C-3/C-4	C-4	C-4/E-5
California													
North Coast	E-5/D-4	C-4	C-4	C-4/A-3	A-3 (C-3)	A-3 ^o	A-2 ^e	A-2 ^e	A-2 ^e	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
South Coast	C-4	C-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-2 ^e	A-2 ^e	A-2 ^e	A-2 ^e	A-2/E-2	E-2/C-3	C-3/C-4	C-4
Southeast	C-4	C-4/C-3	C-3/B-2	B-2/A-2	A-2 (E-2)	A-1 ^e	A-1 ^e	A-1 ^e	A-1 ^e	A-1	A-1/E-2	E-2/C-3	C-3/C-4
Interior	E-5/D-4	C-4	C-4	C-4/A-3	A-3 (C-3)	A-2 ^e	A-2 ^e	A-2 ^e	A-2 ^e	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
Colorado	E-5	E-5/D-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-2 ^e	A-2 ^e	A-2 ^e	A-2 ^e	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
Connecticut	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
Delaware	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-3/C-4	C-4/E-5	E-5
District of Columbia	E-5	E-5/D-4	C-4	C-4/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-3 ^o	A-3 ^o	A-3/C-3	C-3/C-4	C-4/E-5	E-5
Florida	C-4	C-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-3 ^o	A-3 ^o	A-3/C-3	C-3	C-3/C-4	C-4
Georgia	C-4	C-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-2 ^e	A-2 ^e	A-2/C-3	C-3	C-3/C-4	C-4
Hawaii	C-3	C-3	C-3	C-3	C-3	C-3	C-3	C-3	C-3	C-3	C-3	C-3	C-3
Idaho ^b													
N 46° Latitude	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-2	A-2	A-2	A-2/C-3	C-3/C-4	C-4/E-5	E-5
S 46° Latitude	E-5	E-5/D-4	C-4	C-4/A-3	A-3 (C-3)	A-2	A-2	A-2	A-2	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
Illinois													
N 40° Latitude	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-3/C-4	C-4/E-5	E-5
S 40° Latitude	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-3/C-4	C-4	C-4/E-5
Indiana	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-3/C-4	C-4/E-5	E-5
Iowa	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-3/C-4	C-4/E-5	E-5
Kansas	E-5	E-5/D-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-2 ^e	A-2 ^e	A-2 ^e	A-2 ^e	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
Kentucky	E-5	E-5/D-4	C-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-3/C-4	C-4/E-5	E-5
Louisiana	C-4	C-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-2 ^e	A-2 ^e	A-2/C-3	C-3	C-3/C-4	C-4
Maine	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
Maryland	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-3 ^o	A-3 ^o	A-3/C-3	C-3/C-4	C-4/E-5	E-5
Massachusetts	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
Michigan	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
Minnesota	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-3/C-4	C-4/E-5	E-5
Mississippi	C-4	C-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-3	A-3	A-2	A-2	A-2/C-3	C-3	C-3/C-4	C-4
Missouri	E-5	E-5/D-4	C-4	C-4/A-3	A-3 (C-3)	A-3 ^o	A-2 ^e	A-2 ^e	A-2 ^e	A-2/C-3	C-3/C-4	C-4	C-4/E-5
Montana	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-2	A-2	A-2	A-2	A-2/C-3	C-3/C-4	C-4/E-5	E-5
Nebraska	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-2	A-2	A-2	A-2	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
Nevada													
N 38° Latitude	E-5	E-5/D-4	C-4	C-4/A-3	A-3 (C-3)	A-2 ^e	A-2 ^e	A-2 ^e	A-2 ^e	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
S 38° Latitude	C-4	C-4/C-3	C-3/B-2	B-2/A-2	A-2 (E-2)	A-1	A-1	A-1	A-1	A-1/E-2	E-2/C-3	C-3/C-4	C-4/E-5
New Hampshire	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
New Jersey	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
New Mexico													
N 34° Latitude	E-5/D-4	C-4	C-4/C-3	C-3/A-2	A-2 (E-2)	A-1	A-1	A-2	A-2	A-2/E-2	E-2/C-3	C-3/C-4	C-4
S 34° Latitude	C-4	C-4/C-3	C-3/B-2	B-2/A-2	A-2 (E-2)	A-1	A-1	A-1	A-1	A-1/E-2	E-2/C-3	C-3/C-4	C-4
New York	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
North Carolina	E-5/D-4	C-4	C-4	C-4/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-2 ^e	A-2 ^e	A-2/C-3	C-3/C-4	C-4	C-4/E-5
North Dakota	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-2	A-2	A-2	A-2/C-3	C-3/C-4	C-4/E-5	E-5
Ohio	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-3/C-4	C-4/E-5	E-5
Oklahoma	E-5/D-4	C-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-2	A-2	A-2	A-2	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
Oregon													
E 122° Longitude	E-5	E-5/D-4	C-4	C-4/A-3	A-3 (C-3)	A-3	A-2	A-2	A-2	A-2/C-3	C-3/C-4	C-4	C-4/E-5
W 122° Longitude	E-5	E-5/D-4	C-4	C-4/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-2 ^e	A-2 ^e	A-2/C-3	C-3/C-4	C-4/E-5	E-5
Pennsylvania	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
Rhode Island	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
South Carolina	C-4	C-4	C-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-2	A-2	A-2/C-3	C-3/C-4	C-4	C-4
South Dakota	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-2	A-2	A-2	A-2	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
Tennessee	E-5/D-4	C-4	C-4	C-4/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-2 ^e	A-2 ^e	A-2/C-3	C-3/C-4	C-4	C-4/E-5
Texas													
E 99° Longitude	C-4	C-4	C-4/C-3	C-3/A-3	A-3 (C-3)	A-3 ^o	A-2 ^e	A-2 ^e	A-2 ^e	A-2/E-2	E-2/C-3	C-3/C-4	C-4
W 99° Longitude	C-4	C-4/C-3	C-3/B-2	B-2/A-2	A-2 (E-2)	A-1 ^e	A-1 ^e	A-1 ^e	A-1 ^e	A-1/E-2	E-2/C-3	C-3/C-4	C-4
Utah	E-5	E-5/D-4	C-4	C-4/A-3	A-3 (C-3)	A-2 ^e	A-2 ^e	A-2 ^e	A-2 ^e	A-2/E-2	E-2/C-3	C-3/C-4	C-4/E-5
Vermont	E-5	E-5	E-5/D-4	C-4/A-3	A-3 (C-3)	A-3	A-3	A-3	A-3	A-3/C-3	C-4	C-4/E-5	E-5
Virginia	E-5	E-5/D-4	C-4	C-4/A-3	A-3 (C-3)	A-3 ^o	A-3 ^o	A-3 ^o	A-3 ^o	A-3/C-3	C-3/C-4	C-4/E-5	E-5

\$133415 000	212-147
\$133315 000	212-147
\$133115 000	212-147



ATTACHMENT D

RVP 11, ASTM D4814-95a Variable RVP, RVP 13
Spreadsheets and TANKS2 Documentation

Title V Engineer: DM
 Company Name: Sinclair Oil Corp.
 Location: Boise, Idaho
 Date Created: January 4, 1996
 Today's Date: 01/25/96

Calculation of Loading Rack Emissions **THIS SPREADSHEET IS DESIGNED TO ESTIMATE EMISSIONS BY MONTH**
 ENFORCEABLE STANDARD (ASTM D 4814-95a) FOR GASOLINE RVP variance with month

ASSUMPTIONS

1. TANKS2.0 provides the monthly average true vapor pressure of the gasoline product AND the molar fraction of HAP constituents in the vapor phase of the gasoline product.
2. Gasoline RVP varies as allowed by ASTM D4814-95a Specifications. HAP constituents remain the same throughout. They only vary with differing ambient conditions, as predicted by the TANKS2.0 program for HAPs present in the vapor phase.

Reference: AP-42, Sect. 5.2
 only January is changed below

JANUARY

$L_L = 12.46 \text{ SPM/T}$

JANUARY

where L_L = loading loss, lb/(1000 gal)

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, varies lb/lb-mole

T = absolute temperature, R

JANUARY

L_L = see Chart

S = see Chart

P = 4.5876

M = 61.000

T = 511.1

JANUARY Gasoline Throughput, gallons per month, =
 JANUARY

19438.3 E+3 gallons

HAPs Compounds	Vapor Mass Fraction	L_L (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0032	0.0218	0.21
Ethylbenzene	0.0003	0.0020	0.02
Hexane	0.0053	0.0362	0.35
Naphthalene	0.0000	4.07E-06	3.95E-05
Toluene	0.0063	0.0430	0.42
Trimethylpentane (2,2,4)	0.0009	0.0061	0.06
Xylene-m	0.0008	0.0055	0.05
Xylene-o	0.0003	0.0020	0.02
Xylene-p	0.0006	0.0041	0.04
Gasoline (RVP-15)	0.9842	6.7151	65.26
TOTAL			66.44
TOTAL-HAPs ONLY			1.17

FEBRUARY

L_L = 12.46 SPM/T

FEBRUARY

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

FEBRUARY

L_L = see Chart

S = see 1

P = 4.3253

M = 61.859

T = 611.1

Annual Gasoline Throughput, gallons per year, =

FEBRUARY

19438.3 E³ gallons

IIAPs Compounds	Mole Fraction	L _L (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0038	0.0248	0.24
Ethylbenzene	0.0003	0.0020	0.02
Hexane	0.0061	0.0398	0.39
Naphthalene	0.0000	3.89E-06	3.78E-05
Toluene	0.0052	0.0339	0.33
Trimethylpentane (2,2,4)	0.0012	0.0078	0.08
Xylene-m	0.0009	0.0059	0.06
Xylene-o	0.0004	0.0026	0.03
Xylene-p	0.0007	0.0046	0.04
Gasoline (RVP-13.5)	0.9814	6.4012	62.21

TOTAL

63.39

TOTAL-IIAPs ONLY

1.18

MARCH

L_L = 12.46 SPM/T

MARCH

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

MARCH

L_L = see Chart

S = see 1

P = 4.5869

M = 61.873

T = 611.1

Annual Gasoline Throughput, gallons per year, =

MARCH

19438.3 E³ gallons

IIAPs Compounds	Mole Fraction	L _L (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0039	0.0270	0.26
Ethylbenzene	0.0004	0.0028	0.03
Hexane	0.0062	0.0429	0.42
Naphthalene	0.0000	4.12E-06	4.01E-05
Toluene	0.0054	0.0374	0.36
Trimethylpentane (2,2,4)	0.0013	0.0090	0.09
Xylene-m	0.0009	0.0062	0.06
Xylene-o	0.0004	0.0028	0.03
Xylene-p	0.0007	0.0048	0.05
Gasoline (RVP-13.5)	0.9808	6.7857	65.95

TOTAL

67.24

TOTAL-IIAPs ONLY

1.29

APRIL

L_L = 12.46 SPM/T

APRIL

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

APRIL

L_L = see Chart

S = see 1

P = 3.1001

M = 67.049

T = 611.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E+3 gallons

APRIL

IIAPs Compounds	Mole Fraction	L _L (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0063	0.0319	0.31
Ethylbenzene	0.0006	0.0030	0.03
Hexane	0.0100	0.0507	0.49
Naphthalene	0.0000	3.02E-06	2.94E-05
Toluene	0.0089	0.0451	0.44
Trimethylpentane (2,2,4)	0.0023	0.0117	0.11
Xylene-m	0.0016	0.0081	0.08
Xylene-o	0.0007	0.0035	0.03
Xylene-p	0.0012	0.0061	0.06
Gasoline (RVP-9)	0.9684	4.9070	47.69
TOTAL			49.25
TOTAL--IIAPS ONLY			1.56

MAY

L_L = 12.46 SPM/T

MAY

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

MAY

L_L = see Chart

S = see 1

P = 3.401

M = 67.077

T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E+3 gallons

MAY

IIAPs Compounds	Mole Fraction	L _L (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0065	0.0361	0.35
Ethylbenzene	0.0007	0.0039	0.04
Hexane	0.0103	0.0573	0.56
Naphthalene	0.0000	3.31E-06	3.22E-05
Toluene	0.0094	0.0523	0.51
Trimethylpentane (2,2,4)	0.0025	0.0139	0.14
Xylene-m	0.0017	0.0095	0.09
Xylene-o	0.0007	0.0039	0.04
Xylene-p	0.0013	0.0072	0.07
Gasoline (RVP-9)	0.9670	5.3778	52.27
TOTAL			54.06
TOTAL--IIAPS ONLY			1.79

JUNE

L₁ = 12.46 SPM/T

JUNE

where L₁ = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb mole

T = absolute temperature, 508°R

JUNE

L₁ =

see Chart

S = see

1

P =

3.6857

M =

67.101

T =

511.1

Annual Gasoline Throughput, gallons per year, =

JUNE

HAPs Compounds	Mole Fraction	L ₁ (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0067	0.0404	0.39
Ethylbenzene	0.0007	0.0042	0.04
Hexane	0.0105	0.0633	0.62
Naphthalene	0.0000	3.59E-06	3.49E-05
Toluene	0.0098	0.0591	0.57
Trimethylpentane (2,2,4)	0.0027	0.0163	0.16
Xylene-m	0.0018	0.0109	0.11
Xylene-o	0.0008	0.0048	0.05
Xylene-p	0.0013	0.0078	0.08
Gasoline (RVP-9)	0.9657	5.8222	56.59

TOTAL

58.60

TOTAL-HAPs ONLY

2.01

JULY

L₁ = 12.46 SPM/T

JULY

where L₁ = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb mole

T = absolute temperature, °R

JULY

L₁ =

see Chart

S = see

1

P =

3.9976

M =

67.126

T =

511.1

Annual Gasoline Throughput, gallons per year, =

JULY

HAPs Compounds	Mole Fraction	L ₁ (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0069	0.0451	0.44
Ethylbenzene	0.0007	0.0046	0.04
Hexane	0.0108	0.0706	0.69
Naphthalene	0.0000	3.80E-06	3.79E-05
Toluene	0.0102	0.0667	0.65
Trimethylpentane (2,2,4)	0.0029	0.0190	0.18
Xylene-m	0.0019	0.0124	0.12
Xylene-o	0.0008	0.0052	0.05
Xylene-p	0.0014	0.0092	0.09
Gasoline (RVP-9)	0.9644	6.3087	61.32

TOTAL

63.58

TOTAL-HAPs ONLY

2.26

19438.3 E³ gallons

AUGUST

L₁ = 12.46 SPM/T

AUGUST

where L₁ = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

AUGUST

L₁ = see Chart

S = see Chart

P = 3.8657

M = 67.116

T = 611.1

Gasoline Throughput, gallons per month =

AUGUST

HAPs Compounds	Mole Fraction	L ₁ (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0068	0.0430	0.42
Ethylbenzene	0.0007	0.0044	0.04
Hexane	0.0107	0.0677	0.66
Naphthalene	0.0000	3.77E-06	3.66E-05
Toluene	0.0101	0.0639	0.62
Trimethylpentane (2,2,4)	0.0028	0.0177	0.17
Xylene-m	0.0018	0.0114	0.11
Xylene-o	0.0008	0.0051	0.05
Xylene-p	0.0014	0.0089	0.09
Gasoline (RVP-9)	0.9650	6.1035	69.32

TOTAL

61.48

TOTAL--HAPs ONLY

2.16

SEPTEMBER

L₁ = 12.46 SPM/T

SEPTEMBER

where L₁ = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

SEPTEMBER

L₁ = see Chart

S = see Chart

P = 3.5289

M = 67.088

T = 611.1

Gasoline Throughput, gallons per month =

SEPTEMBER

HAPs Compounds	Mole Fraction	L ₁ (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0066	0.0381	0.37
Ethylbenzene	0.0007	0.0040	0.04
Hexane	0.0104	0.0600	0.58
Naphthalene	0.0000	3.44E-06	3.34E-05
Toluene	0.0096	0.0554	0.54
Trimethylpentane (2,2,4)	0.0026	0.0150	0.15
Xylene-m	0.0017	0.0098	0.10
Xylene-o	0.0007	0.0040	0.04
Xylene-p	0.0013	0.0075	0.07
Gasoline (RVP-9)	0.9664	5.5775	54.21

TOTAL

56.09

TOTAL--HAPs ONLY

1.68

19438.3 E+3 gallons

19438.3 E+3 gallons

OCTOBER
L.L. = 12.46 SF/M/T

OCTOBER
where L.L. = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

L.L. = see Chart
S = see Chart
P = 3.5276
M = 66.499
T = 511.1

Gasoline Throughput, gallons per month =

OCTOBER

HAPs Compounds	Mole Fraction	L.L. (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0056	0.0320	0.31
Ethylbenzene	0.0005	0.0029	0.03
Hexane	0.0090	0.0515	0.50
Naphthalene	0.0000	3.41E-06	3.31E-05
Toluene	0.0080	0.0457	0.44
Trimethylpentane (2,2,4)	0.0021	0.0120	0.12
Xylene-m	0.0014	0.0080	0.08
Xylene-o	0.0006	0.0034	0.03
Xylene-p	0.0011	0.0063	0.06
Gasoline (RVP-10)	0.9717	6.5567	64.01

TOTAL 65.58
TOTAL-HAPs ONLY 1.57

NOVEMBER
L.L. = 12.46 SF/M/T

NOVEMBER
where L.L. = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

L.L. = see Chart
S = see Chart
P = 3.6717
M = 64.416
T = 511.1

Gasoline Throughput, gallons per month =

NOVEMBER

HAPs Compounds	Mole Fraction	L.L. (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0046	0.0265	0.26
Ethylbenzene	0.0004	0.0023	0.02
Hexane	0.0074	0.0427	0.41
Naphthalene	0.0000	3.44E-06	3.34E-05
Toluene	0.0064	0.0369	0.36
Trimethylpentane (2,2,4)	0.0015	0.0086	0.08
Xylene-m	0.0011	0.0063	0.06
Xylene-o	0.0005	0.0029	0.03
Xylene-p	0.0008	0.0046	0.04
Gasoline (RVP-11.5)	0.9774	6.6354	64.77

TOTAL 66.04
TOTAL-HAPs ONLY 1.27

19430.3 E+3 gallons

19438.3 E+3 gallons

DECEMBER
LL = 12.46 SPM/T

DECEMBER
where LL = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, 4.0 psia
M = molecular weight of vapor, 66.5 lb/lb-mole
T = absolute temperature, 508°R

LL = see Chart
S = see Chart
P = 4.123
M = 61.847
T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E+3 gallons

DECEMBER

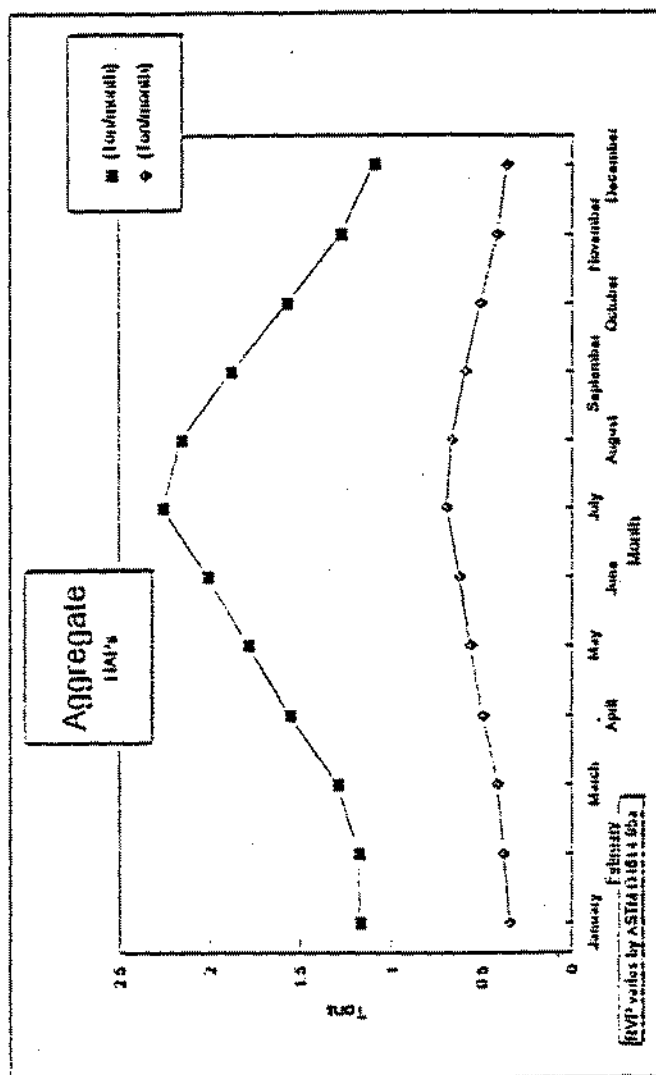
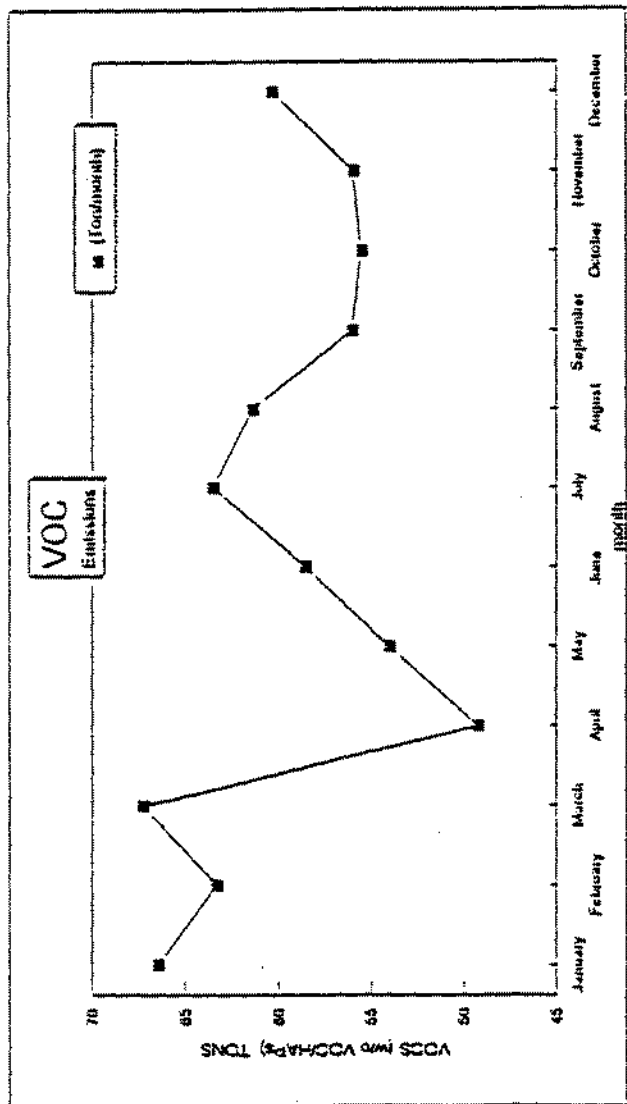
IIAPs Compounds	Mole Fraction	L _i (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0037	0.0230	0.22
Ethylbenzene	0.0003	0.0019	0.02
Hexane	0.0060	0.0373	0.36
Naphthalene	0.0000	3.70E-06	3.60E-05
Toluene	0.0051	0.0317	0.31
Trimethylpentane (2,2,4)	0.0011	0.0068	0.07
Xylene-m	0.0009	0.0056	0.05
Xylene-o	0.0004	0.0025	0.02
Xylene-p	0.0006	0.0037	0.04
Gasoline (RVP-13.5)	0.9820	6.1043	59.33

TOTAL 60.42
TOTAL-IIAPS ONLY 1.09

ANNUAL LOADING RACK EMISSIONS (RVP-10 with Sinclair IIAPs)

VOC Emissions (Ton/yr)	Aggreg IIAP Emissions (Ton/yr)	Single IIAP Hexane Ems (Ton/yr)	Single IIAP Toluene (Ton/yr)
712.17	19.24	6.02	4.50

	VOC Emissions (Ton/month)	Aggregata IIAPs (Ton/month)	Hexane Emissions (Ton/month)
January	66.44	1.17	0.35
February	63.39	1.18	0.39
March	67.24	1.29	0.42
April	49.25	1.56	0.49
May	54.06	1.79	0.56
June	58.60	2.01	0.62
July	63.58	2.26	0.69
August	61.48	2.16	0.66
September	56.09	1.88	0.58
October	55.58	1.57	0.50
November	56.04	1.27	0.41
December	60.42	1.09	0.36



TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

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PAGE 1

Identification

Identification No.: 401 season
City: Boise
State: ID
Company: Sinclair Oil
Type of Tank: External floating Roof

Tank Dimensions

Diameter (ft): 60
Volume(gallons): 839400
Turnovers: 69

Paint Characteristics

Shell Condition: Light Rust
Shell Color/Shader: White/White
Shell Paint Condition: Good

Roof Characteristics

Roof Type: Double Deck
Fitting Category: Typical

Tank Construction and Rim-Seal System

Construction: Welded
Primary Seal: Mechanical Shoe
Secondary Seal: Shoe-mounted

Roof Fitting/Status

Quantity

Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

Metereological Data Used in Emission Calculations: Boise, Idaho

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK

1/24/96
 PAGE 2

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.	Temp. (deg F)	Avg.	Min.	Max.					
Gasoline RVP 9-Sinclair HAPs	APR	52.46	45.90	59.03	51.12	3.1001	N/A	N/A	67.049				
Benzene						0.9440	N/A	N/A		0.0188	0.0063	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0831	N/A	N/A		0.0207	0.0006	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.5673	N/A	N/A		0.0181	0.0100	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.4345	N/A	N/A		0.0151	0.0023	114.22	Option 1
Naphthalene C-10, H-8						0.0017	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2600	N/A	N/A		0.0972	0.0089	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0995	N/A	N/A		0.0448	0.0016	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0539	N/A	N/A		0.0349	0.0007	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0746	N/A	N/A		0.0448	0.0012	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline (RVP 9)						3.8888	N/A	N/A		0.7043	0.9684	66.50	Option 4: RVP=9.00, ASTM Slope=2.5
Gasoline RVP 9-Sinclair HAPs	MAY	56.94	49.41	64.47	51.12	3.4010	N/A	N/A	67.077				
Benzene						1.0722	N/A	N/A		0.0188	0.0065	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0975	N/A	N/A		0.0207	0.0007	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.7660	N/A	N/A		0.0181	0.0103	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.5209	N/A	N/A		0.0151	0.0025	114.22	Option 1
Naphthalene C-10, H-8						0.0021	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2999	N/A	N/A		0.0972	0.0094	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1165	N/A	N/A		0.0448	0.0017	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0636	N/A	N/A		0.0349	0.0007	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0874	N/A	N/A		0.0448	0.0013	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline (RVP 9)						4.2618	N/A	N/A		0.7043	0.9670	66.50	Option 4: RVP=9.00, ASTM Slope=2.5
Gasoline RVP 9-Sinclair HAPs	JUN	60.89	52.92	68.86	51.12	3.6857	N/A	N/A	67.101				
Benzene						1.1969	N/A	N/A		0.0188	0.0067	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.1119	N/A	N/A		0.0207	0.0007	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.9580	N/A	N/A		0.0181	0.0105	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.6006	N/A	N/A		0.0151	0.0027	114.22	Option 1
Naphthalene C-10, H-8						0.0025	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.3394	N/A	N/A		0.0972	0.0098	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1334	N/A	N/A		0.0448	0.0018	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0734	N/A	N/A		0.0349	0.0008	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.1003	N/A	N/A		0.0448	0.0013	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline (RVP 9)						4.6142	N/A	N/A		0.7043	0.9657	66.50	Option 4: RVP=9.00, ASTM Slope=2.5
Gasoline RVP 9-Sinclair HAPs	JUL	64.94	56.05	73.82	51.12	3.9976	N/A	N/A	67.126				
Benzene						1.3371	N/A	N/A		0.0188	0.0069	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.1286	N/A	N/A		0.0207	0.0007	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						2.1725	N/A	N/A		0.0181	0.0108	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.6945	N/A	N/A		0.0151	0.0029	114.22	Option 1

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK, CONT.

01/24/96
 PAGE 3

Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Naphthalene C-10, H-8						0.0030	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.3843	N/A	N/A		0.0972	0.0102	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1530	N/A	N/A		0.0448	0.0019	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0847	N/A	N/A		0.0349	0.0008	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.1152	N/A	N/A		0.0448	0.0014	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline (RVP 9)						4.9999	N/A	N/A		0.7043	0.9644	66.50	Option 4: RVP=9.00, ASTM Slope=2.5
Gasoline RVP 9-Sinclair HAPs	AUG	63.26	55.14	71.38	51.12	3.8657	N/A	N/A	67.116				
Benzene						1.2774	N/A	N/A		0.0188	0.0068	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.1215	N/A	N/A		0.0207	0.0007	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						2.0813	N/A	N/A		0.0181	0.0107	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.6555	N/A	N/A		0.0151	0.0028	114.22	Option 1
Naphthalene C-10, H-8						0.0028	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.3651	N/A	N/A		0.0972	0.0101	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1446	N/A	N/A		0.0448	0.0018	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0798	N/A	N/A		0.0349	0.0008	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.1088	N/A	N/A		0.0448	0.0014	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline (RVP 9)						4.8368	N/A	N/A		0.7043	0.9650	66.50	Option 4: RVP=9.00, ASTM Slope=2.5
Gasoline RVP 9-Sinclair HAPs	SEP	58.75	51.48	66.02	51.12	3.5289	N/A	N/A	67.088				
Benzene						1.1278	N/A	N/A		0.0188	0.0066	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.1039	N/A	N/A		0.0207	0.0007	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.8518	N/A	N/A		0.0181	0.0104	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.5558	N/A	N/A		0.0151	0.0026	114.22	Option 1
Naphthalene C-10, H-8						0.0023	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.3175	N/A	N/A		0.0972	0.0096	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1240	N/A	N/A		0.0448	0.0017	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0679	N/A	N/A		0.0349	0.0007	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0931	N/A	N/A		0.0448	0.0013	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline (RVP 9)						4.4202	N/A	N/A		0.7043	0.9664	66.50	Option 4: RVP=9.00, ASTM Slope=2.5

TANKB - GRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
DETAIL CALCULATIONS (AP-42)

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Month:	January	February	March	April	May	June	July	August	September	October	November	D
Rim Seal Losses (lb):	-	-	-	251.3935	262.6579	270.0463	273.3399	255.2967	229.6753	-	-	
Seal Factor (lb-mole/ft yr (mph) ⁿ):	-	-	-	0.8000	0.8000	0.8000	0.8000	0.8000	0.8000	-	-	
Average Wind Speed (mph):	-	-	-	10.0	9.5	9.0	8.4	8.2	8.2	-	-	
Seal-related Wind Speed Exponent:	-	-	-	1.20	1.20	1.20	1.20	1.20	1.20	-	-	
Value of Vapor Pressure Function:	-	-	-	0.0591	0.0657	0.0720	0.0792	0.0761	0.0685	-	-	
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	-	-	-	3.100072	3.401005	3.685667	3.997641	3.865687	3.528944	-	-	
Tank Diameter (ft):	-	-	-	60	60	60	60	60	60	-	-	
Vapor Molecular Weight (lb/lb-mole):	-	-	-	67.048695	67.076676	67.100921	67.126471	67.115976	67.087662	-	-	
Product Factor:	-	-	-	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	-	-	
Withdrawal losses (lb):	-	-	-	16.2423	16.2423	16.2423	16.2423	16.2423	16.2423	-	-	
Net Throughput (gal/month):	-	-	-	4854530	4854530	4854530	4854530	4854530	4854530	-	-	
Shell Clingage Factor (bbl/1000 sqft):	-	-	-	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	-	-	
Average Organic Liquid Density (lb/gal):	-	-	-	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	-	
Tank Diameter (ft):	-	-	-	60	60	60	60	60	60	-	-	
Roof Fitting Losses (lb):	-	-	-	295.1420	310.6704	321.9596	329.2626	308.6501	277.6742	-	-	
Value of Vapor Pressure Function:	-	-	-	0.0591	0.0657	0.0720	0.0792	0.0761	0.0685	-	-	
Vapor Molecular Weight (lb/lb-mole):	-	-	-	67.048695	67.076676	67.100921	67.126471	67.115976	67.087662	-	-	
Product Factor:	-	-	-	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	-	-	
For. Roof Fitting Loss Fact. (lb-mole/yr):	-	-	-	893.1371	846.0948	799.2734	743.3885	724.8350	724.8350	-	-	
Average Wind Speed (mph):	-	-	-	10.0	9.5	9.0	8.4	8.2	8.2	-	-	
Roof Fitting/Status				Quantity	Roof Fitting Loss Factors							
					Kfa (lb-mole/yr)	Kfb (lb-mole/(yr mph ⁿ))	m					
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.				1	1.20	0.17	1.00					
Unslotted Guide-Pole Well/Ungasketed Sliding Cover				1	0.00	67.00	0.98					
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs				10	0.25	0.07	1.00					
Roof Drain (3-in. Diameter)/Open				1	0.00	7.00	1.40					
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.				1	0.71	0.10	1.00					
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask				1	0.95	0.14	1.00					
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.				1	2.30	5.90	1.00					
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed				1	0.00	0.00	0.00					
Total Losses (lb):	-	-	-	562.78	589.57	608.25	618.84	580.19	523.59	-	-	

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

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Months in Report: April, May, June, July,
August, September

Liquid Contents	Losses (lbs.):			Total Standing	Total
	Total Withdrawal	Roof-Fitting	Rim-Seal		
Gasoline RVP 9-Sinclair NAPs	97.45	1843.36	1542.41	3385.77	3483.22
Benzene	1.83	12.22	10.22	22.44	24.27
Ethylbenzene	2.02	1.25	1.04	2.29	4.31
Hexane (-n)	1.76	19.28	16.13	35.41	37.17
Isooctane	1.47	4.87	4.08	8.95	10.42
Naphthalene C-10, H-8	0.13	0.00	0.00	0.00	0.13
Toluene	9.47	17.84	14.92	32.76	42.24
Xylene (-m)	4.37	3.22	2.70	5.92	10.28
Xylene (-o)	3.40	1.38	1.15	2.53	5.93
Xylene (-p) "Paraxylene"	4.37	2.42	2.03	4.45	8.81
Gasoline (RVP 9)	68.64	1780.88	1490.15	3271.02	3339.66
Totals:	97.45	1843.36	1542.41	3385.77	3483.22

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

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PAGE 1

Identification

Identification No.: 401 season
City: Boise
State: ID
Company: Sinclair Oil
Type of Tank: External Floating Roof

Tank Dimensions

Diameter (ft): 60
Volume(gallons): 839400
Turnovers: 69

Paint Characteristics

Shell Condition: Light Rust
Shell Color/Shader: White/White
Shell Paint Condition: Good

Roof Characteristics

Roof Type: Double Deck
Fitting Category: Typical

Tank Construction and Rim-Seal System

Construction: Welded
Primary Seal: Mechanical Shoe
Secondary Seal: Shoe-mounted

Roof Fitting/Status

Quantity

Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Roof leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

Meteorological Data Used in Emission Calculations: Boise, Idaho

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK

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PAGE 2

Mixture/Component	Month	Daily Liquid Surf.			Liquid Bulk		Vapor Pressures (psia)			Vapor	Liquid	Vapor	Mol. Basis for Vapor Pressure	
		Temperatures (deg F)			Temp.					Mol.	Mass	Mass		
		Avg.	Min.	Max.	(deg F)		Avg.	Min.	Max.	Weight	Fract.	Fract.	Weight	Calculations
Gasoline RVP 10-Sinclair MAPs	All	53.12	47.11	59.13	51.12		3.5386	N/A	N/A	66.499				
Benzene							0.9620	N/A	N/A		0.0188	0.0056	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene							0.0851	N/A	N/A		0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)							1.5952	N/A	N/A		0.0181	0.0090	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane							0.4472	N/A	N/A		0.0151	0.0021	114.22	Option 1
Naphthalene C-10, H-B							0.0017	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene							0.2655	N/A	N/A		0.0972	0.0080	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)							0.1018	N/A	N/A		0.0448	0.0014	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)							0.0553	N/A	N/A		0.0349	0.0006	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"							0.0763	N/A	N/A		0.0448	0.0011	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline (RVP 10)							4.4434	N/A	N/A		0.7043	0.9717	66.00	Option 4: KVP=10.00, ASTM Slope=2.5

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
DETAIL CALCULATIONS (AP-42)

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Annual Emission Calculations

Rim Seal Losses (lb): 2982.8153
Seal factor (lb-mole/ft yr (mph)ⁿ): 0.0000
Average Wind Speed (mph): 8.8
Seal-related Wind Speed Exponent: 1.20
Value of Vapor Pressure function: 0.0687
Vapor Pressure at Daily Average Liquid Surface Temperature (psia): 3.538575
Tank Diameter (ft): 60
Vapor Molecular Weight (lb/lb-mole): 66.498645
Product factor: 1.0000

Withdrawal Losses (lb): 181.5636
Annual Net Throughput (gal/yr): 58254360
Shell Clingage factor (lb/1000 sqft): 0.0015
Average Organic Liquid Density (lb/gal): 0.0000
Tank Diameter (ft): 60

Roof Fitting losses (lb): 3568.1163
Value of Vapor Pressure function: 0.0687
Vapor Molecular Weight (lb/lb-mole): 66.498645
Product factor: 1.0000
Tot. Roof Fitting Loss fact. (lb-mole/yr): 780.6081
Average Wind Speed (mph): 8.8

Roof Fitting/Status	Quantity	Roof fitting loss factors		
		KFa (lb-mole/yr)	KFb (lb-mole/(yr mph ⁿ))	m
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1	1.20	0.17	1.00
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1	0.00	67.00	0.98
Roof Leg (3-in. Diameter)/Adjustable, Buckle-Back Roofs	10	0.25	0.07	1.00
Roof Drain (3-in. Diameter)/Open	1	0.00	7.00	1.40
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00
Gauge Hatch/Sample Well (6-in. Diam.)/Weighted Mech. Actuation, Gask	1	0.95	0.14	1.00
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1	2.30	5.90	1.00
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	0.00	0.00	0.00

Total Losses (lb): 6732.50

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

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Annual Emissions Report

Liquid Contents	Losses (lbs.):			Total Standing	Total
	Total Withdrawal	Roof-Fitting	Rim-Seal		
Gasoline RVP 10-Sinclair HAPs	181.56	3568.12	2982.82	6550.93	6732.50
Benzene	3.41	20.04	16.75	36.79	40.20
Ethylbenzene	3.76	1.95	1.63	3.58	7.34
Hexane (-n)	3.29	31.99	26.74	58.73	62.01
Isooctane	2.74	7.48	6.25	13.74	16.48
Naphthalene C-10, H-8	0.24	0.00	0.00	0.00	0.24
Toluene	17.65	28.59	23.90	52.50	70.14
Xylene (-m)	8.13	5.05	4.23	9.28	17.41
Xylene (-o)	6.34	2.14	1.79	3.92	10.26
Xylene (-p) "Paraxylene"	8.13	3.79	3.17	6.96	15.09
Gasoline (RVP 10)	127.88	3467.00	2898.36	6365.44	6493.31
Total:	181.56	3568.12	2982.82	6550.93	6732.50

TANK PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

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PAGE 1

Identification

Identification No.: 401 season
City: Boise
State: ID
Company: Sinclair Oil
Type of Tank: External floating Roof

Tank Dimensions

Diameter (ft): 60
Volume(gallons): 839400
Turnovers: 69

Paint Characteristics

Shell Condition: Light Rust
Shell Color/Shade: White/White
Shell Paint Condition: Good

Roof Characteristics

Roof Type: Double Deck
Fitting Category: Typical

Tank Construction and Rim-Seal System

Construction: Welded
Primary Seal: Mechanical Shoe
Secondary Seal: Shoe-mounted

Roof Fitting/Status

Quantity

Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Unbolted Guide-Pole Well/Ungasketed Sliding Cover	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

Meteorological Data Used in Emission Calculations: Boise, Idaho

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK

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Mixture/Component	Month	Daily Liquid Surf. Temp.			Liquid Bulk Temp.			Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Basis for Vapor Pressure Weight Calculations	
		Avg.	Min.	Max.	(deg F)	Avg.	Min.	Max.	Avg.	Min.	Max.				
Gasoline RVP 13.5-Sinclair HAP	FEB	45.64	41.69	49.59	51.12	4.3253	N/A	N/A	61.859						
Benzene						0.7734	N/A	N/A				0.0188	0.0038	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0647	N/A	N/A				0.0207	0.0003	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Gasoline (RVP 13.5)						5.3941	N/A	N/A				0.7043	0.9814	61.50	Option 4: RVP=13.50, ASTM Slope=2.5
Hexane (-n)						1.3001	N/A	N/A				0.0181	0.0061	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.3111	N/A	N/A				0.0151	0.0012	114.22	Option 1
Naphthalene C-10, H-8						0.0012	N/A	N/A				0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2078	N/A	N/A				0.0972	0.0052	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0777	N/A	N/A				0.0448	0.0009	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0417	N/A	N/A				0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0581	N/A	N/A				0.0448	0.0007	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 13.5-Sinclair HAP	MAR	48.57	43.26	53.89	51.12	4.5869	N/A	N/A	61.873						
Benzene						0.8432	N/A	N/A				0.0188	0.0039	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0721	N/A	N/A				0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Gasoline (RVP 13.5)						5.7178	N/A	N/A				0.7043	0.9808	61.50	Option 4: RVP=13.50, ASTM Slope=2.5
Hexane (-n)						1.4099	N/A	N/A				0.0181	0.0062	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.3622	N/A	N/A				0.0151	0.0013	114.22	Option 1
Naphthalene C-10, H-8						0.0014	N/A	N/A				0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2290	N/A	N/A				0.0972	0.0054	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0865	N/A	N/A				0.0448	0.0009	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0466	N/A	N/A				0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0648	N/A	N/A				0.0448	0.0007	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 13.5-Sinclair HAP	DEC	43.27	40.11	46.44	51.12	4.1230	N/A	N/A	61.847						
Benzene						0.7206	N/A	N/A				0.0188	0.0037	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0591	N/A	N/A				0.0207	0.0003	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Gasoline (RVP 13.5)						5.1437	N/A	N/A				0.7043	0.9820	61.50	Option 4: RVP=13.50, ASTM Slope=2.5
Hexane (-n)						1.2167	N/A	N/A				0.0181	0.0060	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.2699	N/A	N/A				0.0151	0.0011	114.22	Option 1
Naphthalene C-10, H-8						0.0011	N/A	N/A				0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.1919	N/A	N/A				0.0972	0.0051	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0712	N/A	N/A				0.0448	0.0009	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0380	N/A	N/A				0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0532	N/A	N/A				0.0448	0.0006	106.16	Option 2: A=7.0206, B=1474.403, C=217.773

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Roof Fitting/Status	Quantity	Roof Fitting Loss Factors		
		Kfa (lb-mole/yr)	Kfb (lb-mole/(yr sq ft-in))	m
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1	1.20	0.17	1.00
Unbolted Guide-Pole Well/Ungasketed Sliding Cover	1	0.00	67.00	0.98
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10	0.25	0.07	1.00
Roof Drain (3-in. Diameter)/Open	1	0.00	7.00	1.40
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1	0.71	0.10	1.00
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1	0.95	0.14	1.00
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1	2.50	5.90	1.00
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	0.00	0.00	0.00
Total Losses (lb):	674.58	811.29		

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

01/24/96
PAGE 4

Months In Report: February, March, December

Liquid Contents	Losses (lbs.):			Total Standing	Total
	Total Withdrawal	Roof-Fitting	Rim-Seal		
Gasoline RVP 13.5-Sinclair HAP	48.73	1090.18	916.00	2006.19	2054.91
Benzene	0.92	4.11	3.46	7.57	8.49
Ethylbenzene	1.01	0.38	0.32	0.70	1.71
Gasoline (RVP 13.5)	34.32	1069.83	898.89	1968.72	2003.04
Hexane (-n)	0.88	6.65	5.59	12.24	13.13
Isooctane	0.74	1.34	1.13	2.47	3.20
Naphthalene C-10, H-8	0.06	0.00	0.00	0.00	0.06
Toluene	4.74	5.73	4.81	10.54	15.28
Xylene (-m)	2.18	0.99	0.83	1.82	4.00
Xylene (-o)	1.70	0.41	0.35	0.76	2.46
Xylene (-p) "Paraxylene"	2.18	0.74	0.62	1.36	3.54
Total:	48.73	1090.18	916.00	2006.19	2054.91

TANK PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

11/24/96
PAGE 1

Identification

Identification No.: 401 season
City: Boise
State: ID
Company: Sinclair Oil
Type of Tank: External Floating Roof

Tank Dimensions

Diameter (ft): 60
Volume(gallons): 839400
Turnovers: 69

Paint Characteristics

Shell Condition: Light Rust
Shell Color/Shade: White/White
Shell Paint Condition: Good

Roof Characteristics

Roof Type: Double Deck
Fitting Category: Typical

Tank Construction and Rim-Seal System

Construction: Welded
Primary Seal: Mechanical Shoe
Secondary Seal: Shoe-mounted

Roof Fitting/Status

Quantity

Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Unbolted Guide-Pole Well/Ungasketed Sliding Cover	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask.	1
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

Meteorological Data Used in Emission Calculations: Boise, Idaho

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK

01/24/96
PAGE 2

Mixture/Component	Month	Liquid			Vapor Pressures (psia)	Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Daily Liquid Temp. (deg F)	Surf. Temp. (deg F)	Bulk Temp. (deg F)						
Gasoline RVP 11.5-Sinclair NAP NOV		46.96	42.88	51.04	51.12	3.6717	N/A	N/A	64.415	
Benzene						0.8042	N/A	N/A	0.0188	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0679	N/A	N/A	0.0207	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.3486	N/A	N/A	0.0181	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.3341	N/A	N/A	0.0151	Option 1
Naphthalene C-10, H-8						0.0013	N/A	N/A	0.0013	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2171	N/A	N/A	0.0972	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0816	N/A	N/A	0.0448	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0438	N/A	N/A	0.0349	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0610	N/A	N/A	0.0448	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline (RVP 11.5)						4.6018	N/A	N/A	0.7043	Option 4: RVP=11.50, ASTM Slope=2.5

01/24/96
PAGE 3

[illegible]

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

01/24/96
PAGE 4

Months In Report: November

Liquid Contents	Losses (lbs.):			Total Stalling	Total
	Total Withdrawal	Roof-Fitting	Rim-Seal		
Gasoline RVP 11.5-Sinclair HAP	16.24	286.20	237.60	523.80	540.04
Benzene	0.31	1.30	1.08	2.39	2.69
Ethylbenzene	0.34	0.12	0.10	0.22	0.56
Hexane (-n)	0.29	2.11	1.75	3.86	4.15
Isooctane	0.25	0.44	0.36	0.80	1.04
Naphthalene C-10, H-8	0.02	0.00	0.00	0.00	0.02
Toluene	1.58	1.82	1.51	3.33	4.91
Xylene (-m)	0.73	0.32	0.26	0.58	1.31
Xylene (-o)	0.57	0.13	0.11	0.24	0.81
Xylene (-p) "Paraxylene"	0.73	0.24	0.20	0.43	1.16
Gasoline (RVP 11.5)	11.44	279.73	232.22	511.95	523.19
Totals:	16.24	286.20	237.60	523.80	540.04

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

Identification
Identification No.: 401 season
City: Boise
State: ID
Company: Sinclair Oil
Type of Tank: External Floating Roof

Tank Dimensions
Diameter (ft): 60
Volume(gallons): 839400
Turnovers: 69

Paint Characteristics
Shell Condition: Light Rust
Shell Color/Shade: White/White
Shell Paint Condition: Good

Roof Characteristics
Roof Type: Double Deck
Flitting Category: Typical

Tank Construction and Rim-Seal System
Construction: Welded
Primary Seal: Mechanical Shoe
Secondary Seal: Shore-mounted

Roof Flitting/Status	Quantity
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Installed Guide-Pole Well/Hygasketed Sliding Cover	1
Roof Leg (5-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1
Gauge-Float Well (20-in. Diam.)/Hbolted Cover, Hgask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

Meteorological Data Used in Emission Calculations: Boise, Idaho

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK

01/24/96
PAGE 2

Mixture/Component	Month	Daily Liquid Surf. Temp.			Liquid Bulk Temp.		Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.	(deg F)	(deg F)	Avg.	Min.	Max.					
Gasoline RVP 15-Sinclair HAPs	JAN	42.41	39.23	45.60	51.12		4.5876	N/A	N/A	61.008				
Benzene							0.7021	N/A	N/A		0.0188	0.0032	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene							0.0573	N/A	N/A		0.0207	0.0003	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)							1.1875	N/A	N/A		0.0181	0.0053	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane							0.2550	N/A	N/A		0.0151	0.0009	114.22	Option 1
Naphthalene C-10, H-8							0.0010	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene							0.1864	N/A	N/A		0.0972	0.0044	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)							0.0690	N/A	N/A		0.0448	0.0008	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)							0.0368	N/A	N/A		0.0349	0.0003	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"							0.0515	N/A	N/A		0.0448	0.0006	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline (RVP 15)							5.7176	N/A	N/A		0.7043	0.9842	60.70	Option 4: RVP=15.00, ASTM Slope=2.5

01/24/96
PAGE 3

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TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

01/24/90
PAGE 4

Months in Report: January

Liquid Contents	Losses (lbs.):			Total Standing	Total
	Total Withdrawal	Roof-Fitting	Rim-Seal		
Gasoline RVP 15-Sinclair HAPs	16.24	334.85	275.93	610.78	627.02
Benzene	0.31	1.08	0.89	1.97	2.28
Ethylbenzene	0.34	0.10	0.08	0.18	0.51
Hexane (-n)	0.29	1.76	1.45	3.21	3.50
Isooctane	0.25	0.32	0.26	0.57	0.82
Naphthalene C-10, H-8	0.02	0.00	0.00	0.00	0.02
Toluene	1.58	1.48	1.22	2.71	4.28
Xylene (-m)	0.73	0.25	0.21	0.46	1.19
Xylene (-o)	0.57	0.11	0.09	0.19	0.76
Xylene (-p) "Paraxylene"	0.73	0.19	0.16	0.34	1.07
Gasoline (RVP 15)	11.44	329.57	271.58	601.14	612.58
Totals:	16.24	334.85	275.93	610.78	627.02

Title V Engineer: DM
 Company Name: Sinclair Oil Corp.
 Location: Boise, Idaho
 Date Created: January 4, 1996
 Today's Date: 01/25/96

Calculation of Loading Rack Emissions

THIS SPREADSHEET IS DESIGNED TO ESTIMATE EMISSIONS BY MONTH

ASSUMPTIONS

1. TANKS2.0 provides the monthly average true vapor pressure of the gasoline product AND the molar fraction of HAP constituents in the vapor phase of the gasoline product.
2. RVP 11 gasoline with Sinclair's HAPs used for all calculations.

Reference: AP-42, Sect. 5.2
 only January is changed below

JANUARY

JANUARY

JANUARY

Lt = 12.46 SPM/T

where Lt = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

Lt = see Chart

S = 1

P = 3.1679

M = 65.103

T = 511.1

JANUARY Gasoline Throughput, gallons per month, =

JANUARY

19438.3 E+3 gallons

HAPs	Vapor Mass	Lt	Emissions
Compounds	Fraction	(lb/1000 gal)	(Tons/month)
Benzene	0.0046	0.0231	0.22
Ethylbenzene	0.0004	0.0020	0.02
Hexane	0.0075	0.0377	0.37
Naphthalene	0.0000	3.00E-06	2.91E-05
Toluene	0.0063	0.0317	0.31
Trimethylpentane (2,2,4)	0.0013	0.0065	0.06
Xylene-m	0.0011	0.0055	0.05
Xylene-o	0.0004	0.0020	0.02
Xylene-p	0.0008	0.0040	0.04
Gasoline (RVP-11)	0.9775	4.9146	47.77
TOTAL			49.86
TOTAL - HAPS ONLY			1.09

FEBRUARY
L = 12.48 SPM/T

FEBRUARY
where L = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

FEBRUARY
L = see Chart
S = see Chart
P = 3.892
M = 65.122
T = 511.1
19438.3 E+3 gallons

Gasoline Throughput, gallons per month =
FEBRUARY

HAPs Compounds	Mole Fraction	L (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0047	0.0290	0.26
Ethylbenzene	0.0004	0.0025	0.02
Hexane	0.0077	0.0476	0.46
Naphthalene	0.0000	3.68E-06	3.58E-05
Toluene	0.0066	0.0408	0.40
Trimethylpentane (2,2,4)	0.0015	0.0093	0.09
Xylene-m	0.0011	0.0068	0.07
Xylene-o	0.0005	0.0031	0.03
Xylene-p	0.0008	0.0049	0.05
Gasoline (RVP-11)	0.9766	6.0341	58.65
TOTAL			60.05
TOTAL-HAPS ONLY			1.40

MARCH
L = 12.48 SPM/T

MARCH
where L = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

MARCH
L = see Chart
S = see Chart
P = 3.6011
M = 65.138
T = 511.1
19438.3 E+3 gallons

Gasoline Throughput, gallons per month =
MARCH

HAPs Compounds	Mole Fraction	L (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0049	0.0280	0.27
Ethylbenzene	0.0005	0.0029	0.03
Hexane	0.0070	0.0446	0.43
Naphthalene	0.0000	3.41E-06	3.31E-05
Toluene	0.0078	0.0446	0.43
Trimethylpentane (2,2,4)	0.0017	0.0097	0.09
Xylene-m	0.0012	0.0069	0.07
Xylene-o	0.0005	0.0029	0.03
Xylene-p	0.0009	0.0051	0.05
Gasoline (RVP-11)	0.9758	5.5799	54.23
TOTAL			55.64
TOTAL-HAPS ONLY			1.41

APRIL

L_L = 12.46 SPM/T

APRIL

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

APRIL

L_L = see Chart

S = see 1

P = 3.8986

M = 65.138

T = 511.1

Gasoline Throughput, gallons per month =

19438.3 E+3 gallons

APRIL

HAAPs Compounds	Mole Fraction	L _L (lb/100 gal)	Emissions (Ton/month)
Benzene	0.0050	0.0310	0.30
Ethylbenzene	0.0005	0.0031	0.03
Hexane	0.0080	0.0495	0.48
Naphthalene	0.0000	3.69E-06	3.69E-05
Toluene	0.0072	0.0446	0.43
Trimethylpentane (2,2,4)	0.0019	0.0118	0.11
Xylene-m	0.0013	0.0080	0.08
Xylene-o	0.0005	0.0031	0.03
Xylene-p	0.0009	0.0056	0.05
Gasoline (RVP-10)	0.9747	6.0341	58.65

TOTAL

60.17

TOTAL-HAAPS ONLY

1.52

MAY

L_L = 12.46 SPM/T

MAY

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

MAY

L_L = see Chart

S = see 1

P = 4.2652

M = 65.185

T = 511.1

Gasoline Throughput, gallons per month =

19438.3 E+3 gallons

MAY

HAAPs Compounds	Mole Fraction	L _L (lb/100 gal)	Emissions (Ton/month)
Benzene	0.0052	0.0352	0.34
Ethylbenzene	0.0005	0.0034	0.03
Hexane	0.0083	0.0563	0.55
Naphthalene	0.0000	4.04E-06	3.93E-05
Toluene	0.0075	0.0508	0.49
Trimethylpentane (2,2,4)	0.0020	0.0138	0.13
Xylene-m	0.0014	0.0095	0.09
Xylene-o	0.0006	0.0041	0.04
Xylene-p	0.0010	0.0068	0.07
Gasoline (RVP-11)	0.9735	6.5981	64.13

TOTAL

65.87

TOTAL-HAAPS ONLY

1.75

JUNE

L₁ = 12.46 SPM/T

JUNE

where L₁ = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

JUNE

L₁ = see Chart

S = see Chart

P = 4.6111

M = 65.208

T = 611.1

Gasoline Throughput, gallons per month =

JUNE

HAPs Compounds	Mole Fraction	L ₁ (lb/1000 gal)	Emissions (Tons/month)
Benzene	0.0054	0.0398	0.38
Ethylbenzene	0.0008	0.0044	0.04
Hexane	0.0085	0.0623	0.61
Naphthalene	0.0000	4.37E-06	4.25E-05
Toluene	0.0079	0.0579	0.56
Trimethylpentane (2,2,4)	0.0022	0.0161	0.16
Xylene-m	0.0014	0.0103	0.10
Xylene-o	0.0008	0.0044	0.04
Xylene-p	0.0010	0.0073	0.07
Gasoline (RVP-11)	0.9735	7.1355	69.35

TOTAL

71.32

TOTAL-HAPs ONLY

1.97

JULY

L₁ = 12.46 SPM/T

JULY

where L₁ = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, lb/lb-mole

T = absolute temperature, °R

JULY

L₁ = see Chart

S = see Chart

P = 4.9892

M = 65.228

T = 611.1

Gasoline Throughput, gallons per month =

JULY

HAPs Compounds	Mole Fraction	L ₁ (lb/1000 gal)	Emissions (Tons/month)
Benzene	0.0054	0.0428	0.42
Ethylbenzene	0.0008	0.0048	0.05
Hexane	0.0085	0.0674	0.66
Naphthalene	0.0000	4.73E-06	4.60E-05
Toluene	0.0079	0.0627	0.61
Trimethylpentane (2,2,4)	0.0022	0.0175	0.17
Xylene-m	0.0014	0.0111	0.11
Xylene-o	0.0008	0.0048	0.05
Xylene-p	0.0011	0.0087	0.08
Gasoline (RVP-11)	0.9724	7.7148	74.98

TOTAL

77.12

TOTAL-HAPs ONLY

2.14

19438.3 E+3 gallons

19438.3 E+3 gallons

AUGUST

L_L = 12.46 SPM/T

AUGUST

where L_L = loading loss, lb/1000 gal
 S = saturation factor, dimensionless, 1.0
 P = true vapor pressure, psia
 M = molecular weight of vapor, lb/lb-mole
 T = absolute temperature, °R

AUGUST

L_L = see Chart
 S = see Chart
 P = 4.0293
 M = 65.219
 T = 511.1

Gasoline Throughput, gallons per month =

19438.3 E+3 gallons

AUGUST

HAAPs Compounds	Mole Fraction	L _L (lb/100 gal)	Emissions (lb/month)
Benzene	0.0055	0.0422	0.41
Ethylbenzene	0.0008	0.0046	0.04
Hexane	0.0006	0.0060	0.04
Naphthalene	0.0000	4.58E-06	4.45E-05
Toluene	0.0081	0.0622	0.60
Trimethylpentane (2,2,4)	0.0023	0.0177	0.17
Xylene-m	0.0015	0.0115	0.11
Xylene-o	0.0008	0.0046	0.04
Xylene-p	0.0011	0.0084	0.08
Gasoline (RVP-11)	0.9717	7.4608	72.51

TOTAL

74.62

TOTAL-HAAPS ONLY

2.11

SEPTEMBER

L_L = 12.46 SPM/T

SEPTEMBER

where L_L = loading loss, lb/1000 gal
 S = saturation factor, dimensionless, 1.0
 P = true vapor pressure, psia
 M = molecular weight of vapor, lb/lb-mole
 T = absolute temperature, °R

SEPTEMBER

L_L = see Chart
 S = see Chart
 P = 4.4208
 M = 65.194
 T = 511.1

Gasoline Throughput, gallons per month =

19438.3 E+3 gallons

SEPTEMBER

HAAPs Compounds	Mole Fraction	L _L (lb/100 gal)	Emissions (lb/month)
Benzene	0.0053	0.0372	0.36
Ethylbenzene	0.0005	0.0035	0.03
Hexane	0.0004	0.0090	0.07
Naphthalene	0.0000	4.19E-06	4.07E-05
Toluene	0.0084	0.0590	0.57
Trimethylpentane (2,2,4)	0.0021	0.0148	0.14
Xylene-m	0.0014	0.0098	0.10
Xylene-o	0.0008	0.0042	0.04
Xylene-p	0.0010	0.0070	0.07
Gasoline (RVP-11)	0.9730	6.8362	66.44

TOTAL

68.33

TOTAL-HAAPS ONLY

1.89

OCTOBER
L₁ = 12.48 SPM/T

OCTOBER
where L₁ = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

L₁ = see Chart
S = see Chart
P = 3.9387
M = 65.163
T = 511.1
19438.3 E+3 gallons

Gasoline Throughput, gallons per month =
OCTOBER

HAPs Compounds	Mole Fraction	L ₁ (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0050	0.0313	0.30
Ethylbenzene	0.0005	0.0031	0.03
Hexane	0.0081	0.0507	0.49
Naphthalene	0.0000	3.73E-06	3.62E-05
Toluene	0.0072	0.0450	0.44
Trimethylpentane (2,2,4)	0.0019	0.0119	0.12
Xylene-m	0.0013	0.0081	0.08
Xylene-o	0.0005	0.0031	0.03
Xylene-p	0.0010	0.0063	0.06
Gasoline (RVP-11)	0.9746	6.0978	69.27
TOTAL			60.82
TOTAL--HAPS ONLY			1.55

NOVEMBER
L₁ = 12.46 SPM/T

NOVEMBER
where L₁ = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

L₁ = see Chart
S = see Chart
P = 3.4834
M = 65.129
T = 511.1
19438.3 E+3 gallons

Gasoline Throughput, gallons per month =
NOVEMBER

HAPs Compounds	Mole Fraction	L ₁ (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0048	0.0285	0.28
Ethylbenzene	0.0004	0.0022	0.02
Hexane	0.0077	0.0426	0.41
Naphthalene	0.0000	3.30E-06	3.20E-05
Toluene	0.0067	0.0371	0.36
Trimethylpentane (2,2,4)	0.0016	0.0088	0.09
Xylene-m	0.0012	0.0066	0.06
Xylene-o	0.0005	0.0028	0.03
Xylene-p	0.0009	0.0050	0.05
Gasoline (RVP-11)	0.9762	6.3990	52.47
TOTAL			53.75
TOTAL--HAPS ONLY			1.28

DECEMBER
L_L = 12.46 SPM/T

DECEMBER
where L_L = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, psia
M = molecular weight of vapor, lb/lb-mole
T = absolute temperature, °R

L_L = see Chart
S = 1
P = 9.2257
M = 65.108
T = 511.1

10438.3 E³ gallon

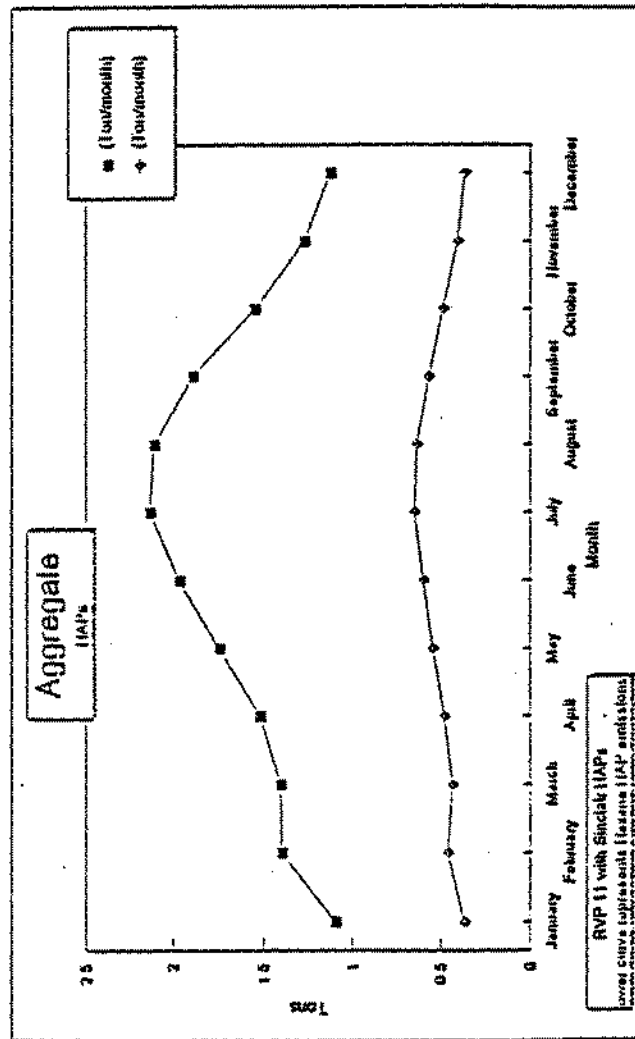
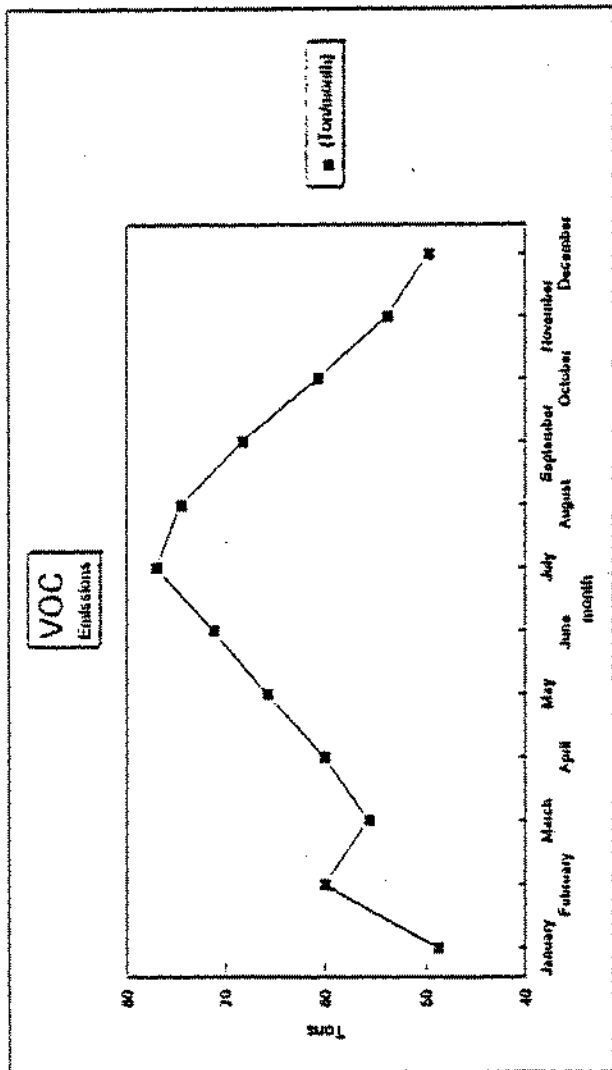
Gasoline Throughput, gallons per month =
DECEMBER

IIAPs Compounds	Mole Fraction	L _L (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0046	0.0236	0.23
Ethylbenzene	0.0004	0.0020	0.02
Hexane	0.0075	0.0384	0.37
Napthalene	0.0000	3.05E-08	2.87E-05
Toluene	0.0064	0.0328	0.32
Trimethylpentane (2,2,4)	0.0014	0.0072	0.07
Xylene-m	0.0011	0.0056	0.05
Xylene-o	0.0005	0.0026	0.02
Xylene-p	0.0008	0.0041	0.04
Gasoline (RVP-11)	0.9772	5.0031	48.63
TOTAL			49.76
TOTAL-IIAPS ONLY			1.13

ANNUAL LOADING RACK EMISSIONS (RVP-11 with Sinclair IIAPs)

VOC Emissions (Ton/yr)	Aggreg IIAP Emissions (Ton/yr)	Single IIAP Hexane Emiss (Ton/yr)	Single IIAP Toluene (Ton/yr)
746.30	19.23	6.05	4.46

	VOC Emissions (Ton/month)	Aggregate IIAPs (Ton/month)	Hexane Emissions (Ton/month)
January	48.88	1.09	0.37
February	60.05	1.40	0.46
March	55.64	1.41	0.43
April	60.17	1.52	0.48
May	65.87	1.75	0.55
June	71.32	1.97	0.61
July	77.12	2.14	0.66
August	74.62	2.11	0.64
September	68.33	1.89	0.57
October	60.82	1.55	0.49
November	53.75	1.28	0.41
December	49.76	1.13	0.37



TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
TANK IDENTIFICATION AND PHYSICAL CHARACTERISTICS

RVP 11. W/ SINCLAIR HATS.

Identification
Identification No.: 401 RVP 11
City: Boise
State: ID
Company: Sinclair Oil Corp.
Type of Tank: External Floating Roof

Tank Dimensions
Diameter (ft): 60
Volume(gallons): 839400
Turnovers: 69

Paint Characteristics
Shell Condition: Light Rust
Shell Color/Shader: White/White
Shell Paint Condition: Good

Roof Characteristics
Roof Type: Double Deck
Fitting Category: Typical

Tank Construction and Air-Seal System
Construction: Welded
Primary Seal: Mechanical Shoe
Secondary Seal: Rim-mounted

Roof Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Roof leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

Meteorological Data Used in Emission Calculations: Boise, Idaho

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK

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Mixture/Component	Month	Daily Liquid Surf. Temp.			Liquid Bulk Temp.			Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Basis for Vapor Pressure Weight Calculations	
		Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.					
Gasoline RVP 11	JAN	42.41	39.23	45.60	51.12			3.1679	N/A	N/A	65.103				
Gasoline - Unleaded (RVP 11)								3.9791	N/A	N/A		0.7043	0.9775	64.70	Option 4: RVP=11.00, ASTM Slope=2.5
Benzene								0.7021	N/A	N/A		0.0188	0.0046	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene								0.0573	N/A	N/A		0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)								1.1875	N/A	N/A		0.0181	0.0075	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane								0.2550	N/A	N/A		0.0151	0.0013	114.22	Option 1
Naphthalene C-10, H-8								0.0010	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene								0.1864	N/A	N/A		0.0972	0.0063	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)								0.0690	N/A	N/A		0.0448	0.0011	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)								0.0368	N/A	N/A		0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"								0.0515	N/A	N/A		0.0448	0.0008	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	FEB	45.64	41.69	49.59	51.12			3.3892	N/A	N/A	65.122				
Gasoline - Unleaded (RVP 11)								4.2544	N/A	N/A		0.7043	0.9766	64.70	Option 4: RVP=11.00, ASTM Slope=2.5
Benzene								0.7734	N/A	N/A		0.0188	0.0047	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene								0.0647	N/A	N/A		0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)								1.3001	N/A	N/A		0.0181	0.0077	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane								0.3111	N/A	N/A		0.0151	0.0015	114.22	Option 1
Naphthalene C-10, H-8								0.0012	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene								0.2078	N/A	N/A		0.0972	0.0066	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)								0.0777	N/A	N/A		0.0448	0.0011	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)								0.0417	N/A	N/A		0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"								0.0581	N/A	N/A		0.0448	0.0008	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	MAR	48.57	43.26	53.09	51.12			3.6011	N/A	N/A	65.138				
Gasoline - Unleaded (RVP 11)								4.5178	N/A	N/A		0.7043	0.9758	64.70	Option 4: RVP=11.00, ASTM Slope=2.5
Benzene								0.8432	N/A	N/A		0.0188	0.0049	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene								0.0721	N/A	N/A		0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)								1.4099	N/A	N/A		0.0181	0.0078	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane								0.3622	N/A	N/A		0.0151	0.0017	114.22	Option 1
Naphthalene C-10, H-8								0.0014	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene								0.2290	N/A	N/A		0.0972	0.0068	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)								0.0865	N/A	N/A		0.0448	0.0012	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)								0.0466	N/A	N/A		0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"								0.0648	N/A	N/A		0.0448	0.0009	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	APR	52.46	45.90	59.03	51.12			3.8986	N/A	N/A	65.160				
Gasoline - Unleaded (RVP 11)								4.8873	N/A	N/A		0.7043	0.9747	64.70	Option 4: RVP=11.00, ASTM Slope=2.5
Benzene								0.9440	N/A	N/A		0.0188	0.0050	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene								0.0831	N/A	N/A		0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)								1.5673	N/A	N/A		0.0181	0.0080	86.17	Option 2: A=6.8760, B=1171.170, C=224.410

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK, CONT.

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Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight Basis for Vapor Pressure Calculations	
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Isooctane						0.4345	N/A	N/A		0.0151	0.0019	114.22	Option 1
Naphthalene C-10, H-8						0.0017	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2600	N/A	N/A		0.0972	0.0072	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0995	N/A	N/A		0.0448	0.0013	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0539	N/A	N/A		0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0746	N/A	N/A		0.0448	0.0009	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	MAY	56.94	49.41	64.47	51.12	4.2652	N/A	N/A	65.185				
Gasoline - Unleaded (RVP 11)						5.3421	N/A	N/A		0.7043	0.9735	64.70	Option 4: RVP=11.00, ASTM slope=2.5
Benzene						1.0722	N/A	N/A		0.0188	0.0052	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0975	N/A	N/A		0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.7660	N/A	N/A		0.0181	0.0083	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.5209	N/A	N/A		0.0151	0.0020	114.22	Option 1
Naphthalene C-10, H-8						0.0021	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2999	N/A	N/A		0.0972	0.0075	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1165	N/A	N/A		0.0448	0.0014	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0636	N/A	N/A		0.0349	0.0006	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0874	N/A	N/A		0.0448	0.0010	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	JUN	60.89	52.92	68.86	51.12	4.6111	N/A	N/A	65.206				
Gasoline - Unleaded (RVP 11)						5.7708	N/A	N/A		0.7043	0.9724	64.70	Option 4: RVP=11.00, ASTM slope=2.5
Benzene						1.1969	N/A	N/A		0.0188	0.0054	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.1119	N/A	N/A		0.0207	0.0006	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.9580	N/A	N/A		0.0181	0.0085	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.6006	N/A	N/A		0.0151	0.0022	114.22	Option 1
Naphthalene C-10, H-8						0.0025	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.3394	N/A	N/A		0.0972	0.0079	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1334	N/A	N/A		0.0448	0.0014	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0734	N/A	N/A		0.0349	0.0006	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.1003	N/A	N/A		0.0448	0.0011	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	JUL	64.94	56.05	73.82	51.12	4.9892	N/A	N/A	65.229				
Gasoline - Unleaded (RVP 11)						6.2389	N/A	N/A		0.7043	0.9713	64.70	Option 4: RVP=11.00, ASTM slope=2.5
Benzene						1.3371	N/A	N/A		0.0188	0.0056	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.1286	N/A	N/A		0.0207	0.0006	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						2.1725	N/A	N/A		0.0181	0.0087	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.6945	N/A	N/A		0.0151	0.0023	114.22	Option 1
Naphthalene C-10, H-8						0.0030	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.3843	N/A	N/A		0.0972	0.0083	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1530	N/A	N/A		0.0448	0.0015	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0847	N/A	N/A		0.0349	0.0007	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.1152	N/A	N/A		0.0448	0.0011	106.16	Option 2: A=7.0206, B=1474.403, C=217.773

TANKS PROGRAM 2.0
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LIQUID CONTENTS OF STORAGE TANK, CONT.

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Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight Basis for Vapor Pressure Calculations	
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Gasoline RVP 11	AUG	63.26	55.14	71.38	51.12	4.8293	N/A	N/A	65.219				
Gasoline - Unleaded (RVP 11)						6.0411	N/A	N/A		0.7043	0.9717	64.70	Option 4: RVP=11.00, ASTM Slope=2.5
Benzene						1.2774	N/A	N/A		0.0188	0.0055	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.1215	N/A	N/A		0.0207	0.0006	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						2.0813	N/A	N/A		0.0181	0.0086	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.6555	N/A	N/A		0.0151	0.0023	114.22	Option 1
Naphthalene C-10, H-8						0.0028	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.3651	N/A	N/A		0.0972	0.0081	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1446	N/A	N/A		0.0448	0.0015	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0798	N/A	N/A		0.0349	0.0006	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.1088	N/A	N/A		0.0448	0.0011	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	SEP	58.75	51.48	66.02	51.12	4.4208	N/A	N/A	65.194				
Gasoline - Unleaded (RVP 11)						5.5350	N/A	N/A		0.7043	0.9730	64.70	Option 4: RVP=11.00, ASTM Slope=2.5
Benzene						1.1278	N/A	N/A		0.0188	0.0053	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.1039	N/A	N/A		0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.8518	N/A	N/A		0.0181	0.0084	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.5558	N/A	N/A		0.0151	0.0021	114.22	Option 1
Naphthalene C-10, H-8						0.0023	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.3175	N/A	N/A		0.0972	0.0077	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1240	N/A	N/A		0.0448	0.0014	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0679	N/A	N/A		0.0349	0.0006	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0931	N/A	N/A		0.0448	0.0010	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	OCT	52.97	47.03	58.91	51.12	3.9387	N/A	N/A	65.163				
Gasoline - Unleaded (RVP 11)						4.9369	N/A	N/A		0.7043	0.9746	64.70	Option 4: RVP=11.00, ASTM Slope=2.5
Benzene						0.9578	N/A	N/A		0.0188	0.0050	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0846	N/A	N/A		0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.5887	N/A	N/A		0.0181	0.0081	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.4443	N/A	N/A		0.0151	0.0019	114.22	Option 1
Naphthalene C-10, H-8						0.0017	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2642	N/A	N/A		0.0972	0.0072	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.1013	N/A	N/A		0.0448	0.0013	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0550	N/A	N/A		0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0759	N/A	N/A		0.0448	0.0010	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	NOV	46.96	42.88	51.04	51.12	3.4834	N/A	N/A	65.129				
Gasoline - Unleaded (RVP 11)						4.3714	N/A	N/A		0.7043	0.9762	64.70	Option 4: RVP=11.00, ASTM Slope=2.5
Benzene						0.8042	N/A	N/A		0.0188	0.0048	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0679	N/A	N/A		0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.3486	N/A	N/A		0.0181	0.0077	86.17	Option 2: A=6.8760, B=1171.170, C=224.410

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK, CONT.

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Mixture/Component	Month	Daily Liquid Surf. Temp. (deg F)			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Isooctane						0.3341	N/A	N/A		0.0151	0.0016	114.22	Option 1
Naphthalene C-10, H-B						0.0013	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2171	N/A	N/A		0.0972	0.0067	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0816	N/A	N/A		0.0448	0.0012	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0438	N/A	N/A		0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0610	N/A	N/A		0.0448	0.0009	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline RVP 11	DEC	43.27	40.11	46.44	51.12	3.2257	N/A	N/A	65.108				
Gasoline - Unleaded (RVP 11)						4.0510	N/A	N/A		0.7043	0.9772	64.70	Option 4: RVP=11.00, ASTM Slope=2.5
Benzene						0.7206	N/A	N/A		0.0188	0.0046	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0591	N/A	N/A		0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Hexane (-n)						1.2167	N/A	N/A		0.0181	0.0075	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.2699	N/A	N/A		0.0151	0.0014	114.22	Option 1
Naphthalene C-10, H-B						0.0011	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.1919	N/A	N/A		0.0972	0.0064	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0712	N/A	N/A		0.0448	0.0011	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0380	N/A	N/A		0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0532	N/A	N/A		0.0448	0.0008	106.16	Option 2: A=7.0206, B=1474.403, C=217.773

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
DETAIL CALCULATIONS (AP-42)

01/19/96
 PAGE 6

Months:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	31.5640	38.3478	45.6849	50.1029	52.9255	55.0617	56.5901	53.0748	47.6817	42.0859	36.9337	32.621
Seal factor (lb-mole/ft yr (mph) ⁿ):	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.200
Average Wind Speed (mph):	8.0	9.0	10.0	10.0	9.5	9.0	8.4	8.2	8.2	8.3	8.4	8.
Seal-related Wind Speed Exponent:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Value of Vapor Pressure Functions:	0.0606	0.0654	0.0701	0.0769	0.0855	0.0938	0.1033	0.0992	0.0892	0.0778	0.0675	0.061
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.167891	3.389215	3.601107	3.898647	4.265205	4.611056	4.989156	4.829343	4.420750	3.938654	3.483379	3.2256
Tank Diameter (ft):	60	60	60	60	60	60	60	60	60	60	60	6
Vapor Molecular Weight (lb/lb-mole):	65.103257	65.121906	65.138354	65.160120	65.184702	65.206125	65.228744	65.219434	65.194406	65.162934	65.129370	65.1082
Product factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000
Withdrawal losses (lb):	14.9706	14.9706	14.9706	14.9706	14.9706	14.9706	14.9706	14.9706	14.9706	14.9706	14.9706	14.970
Net Throughput (gal/month):	4854530	4854530	4854530	4854530	4854530	4854530	4854530	4854530	4854530	4854530	4854530	485453
Shell Clingage Factor (lb/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.001
Average Organic Liquid Density (lb/gal):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
Tank Diameter (ft):	60	60	60	60	60	60	60	60	60	60	60	6
Roof Fitting losses (lb):	232.2319	283.7999	340.0241	372.9062	392.8066	407.4941	417.3458	390.9604	351.2336	310.1965	272.3822	240.149
Value of Vapor Pressure Functions:	0.0606	0.0654	0.0701	0.0769	0.0855	0.0938	0.1033	0.0992	0.0892	0.0778	0.0675	0.061
Vapor Molecular Weight (lb/lb-mole):	65.103257	65.121906	65.138354	65.160120	65.184702	65.206125	65.228744	65.219434	65.194406	65.162934	65.129370	65.1082
Product factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000
Tot. Roof Fitting Loss Fact. (lb-mole/yr):	706.3198	799.2734	893.1371	893.1371	846.0948	799.2734	743.3885	724.8350	724.8350	734.1070	743.3885	715.572
Average Wind Speed (mph):	8.0	9.0	10.0	10.0	9.5	9.0	8.4	8.2	8.2	8.3	8.4	8.
Roof Fitting/Status												
				Quantity	Roof Fitting Loss Factors							
					Kfa (lb-mole/yr)	Kfb (lb-mole/(yr mph ⁿ))		m				
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.				1	1.20	0.17		1.00				
Unslotted Guide-Pole Well/Ungasketed Sliding Cover				1	0.00	67.00		0.98				
Roof leg (3-in. Diameter)/Adjustable, Double-Deck Roofs				10	0.25	0.07		1.00				
Roof Drain (3-in. Diameter)/Open				1	0.00	7.00		1.40				
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.				1	0.71	0.10		1.00				
Gauge Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask				1	0.95	0.14		1.00				
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.				1	2.30	5.90		1.00				
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed				1	0.00	0.00		0.00				
Total Losses (lb):	278.77	337.12	400.68	437.98	460.70	477.53	488.91	459.01	413.89	367.25	324.29	287.74

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

01/19/96
PAGE 7

Months in Report: January, February, March, April,
May, June, July, August,
September, October, November, December

Liquid Contents	Losses (lbs.):			Total Starling	Total
	Total Withdrawal	Roof-Fitting	Rim-Seal		
Gasoline RVP 11	179.65	4011.53	542.67	4554.20	4733.85
Gasoline - Unleaded (RVP 11)	126.53	3907.97	528.66	4436.63	4563.15
Benzene	3.38	20.49	2.77	23.26	26.64
Ethylbenzene	3.72	2.02	0.27	2.29	6.01
Hexane (-n)	3.25	32.63	4.41	37.04	40.29
Isooctane	2.71	7.63	1.03	8.67	11.38
Naphthalene C-10, H-8	0.23	0.00	0.00	0.00	0.24
Toluene	17.46	29.41	3.98	33.39	50.86
Xylene (-m)	8.05	5.23	0.71	5.94	13.99
Xylene (-o)	6.27	2.22	0.30	2.52	8.79
Xylene (-p) "Paraxylene"	8.05	3.92	0.53	4.45	12.50
Total:	179.65	4011.53	542.67	4554.20	4733.85

170.715 COMBINED HAPs
0.0854 TON/YR COMBINED HAPs

Title V Engineer: DM
 Company Name: Sinclair Oil Corp.
 Location: Boise, Idaho
 Date Created: January 4, 1996
 Today's Date: 01/19/96

Calculation of Loading Rack Emissions

THIS SPREADSHEET IS DESIGNED TO ESTIMATE EMISSIONS BY MONTH

ASSUMPTIONS

1. TANKS2.0 provides the monthly average true vapor pressure of the gasoline product AND the molar fraction of HAP constituents in the vapor phase of the gasoline product.

Reference: AP-42, Sect. 5.2
 only January is changed below

JANUARY

JANUARY

JANUARY

L = 12.46 SPM/T

where L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

L = see Chart

S = 1

P = 3.8727

M = 62.354

T = 511.1

JANUARY Gasoline Throughput, gallons per month, =

JANUARY

19438.3 E+3 gallons

HAPs Compounds	Vapor Mass Fraction (lb/lb gal)	L (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0038	0.0224	0.22
Ethylbenzene	0.0003	0.0018	0.02
Hexane	0.0062	0.0365	0.35
Naphthalene	0.0000	3.51E-06	3.41E-05
Toluene	0.0052	0.0308	0.30
Trimethylpentane (2,2,4)	0.0011	0.0065	0.06
Xylene-m	0.0009	0.0053	0.05
Xylene-o	0.0004	0.0024	0.02
Xylene-p	0.0007	0.0041	0.04
Gasoline (RVP-13)	0.9814	5.7772	56.15

TOTAL

TOTAL-HAPs ONLY

57.21

1.06

FEBRUARY

L_L = 12.46 SPM/T

FEBRUARY

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

FEBRUARY

L_L = see Chart

S = 1

P = 4.136

M = 62.371

T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E³ gallons

FEBRUARY

IIAPs Compounds	Mole Fraction	L _L (lb/100 gal)	Emissions (Ton/month)
Benzene	0.0039	0.0245	0.24
Ethylbenzene	0.0004	0.0025	0.02
Hexane	0.0063	0.0398	0.39
Naphthalene	0.0000	3.75E-06	3.64E-05
Toluene	0.0054	0.0340	0.33
Trimethylpentane (2,2,4)	0.0013	0.0082	0.08
Xylene-m	0.0009	0.0057	0.06
Xylene-o	0.0004	0.0025	0.02
Xylene-p	0.0007	0.0044	0.04
Gasoline (RVP-10) 13	0.9808	6.1668	69.94

TOTAL

81.12

TOTAL-IIAPS ONLY

1.18

MARCH

L_L = 12.46 SPM/T

MARCH

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

MARCH

L_L = see Chart

S = 1

P = 4.3870

M = 62.388

T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E³ gallons

MARCH

IIAPs Compounds	Mole Fraction	L _L (lb/100 gal)	Emissions (Ton/month)
Benzene	0.0040	0.0267	0.26
Ethylbenzene	0.0004	0.0027	0.03
Hexane	0.0065	0.0434	0.42
Naphthalene	0.0000	3.98E-06	3.87E-05
Toluene	0.0057	0.0380	0.37
Trimethylpentane (2,2,4)	0.0014	0.0093	0.09
Xylene-m	0.0010	0.0067	0.06
Xylene-o	0.0004	0.0027	0.03
Xylene-p	0.0007	0.0047	0.05
Gasoline (RVP-10) 13	0.8799	6.5390	63.55

TOTAL

64.86

TOTAL-IIAPS ONLY

1.30

APRIL

L_L = 12.46 SPM/T

APRIL

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

APRIL

L_L = see Chart

S = 666

P = 4.7407

M = 62.405

T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E³ gallons

APRIL

HA Ps Compounds	Mole Fraction	L _L (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0042	0.0303	0.29
Ethylbenzene	0.0004	0.0029	0.03
Hexane	0.0067	0.0483	0.47
Naphthalene	0.0000	4.30E-06	4.18E-05
Toluene	0.0059	0.0426	0.41
Trimethylpentane (2,2,4)	0.0015	0.0108	0.11
Xylene-m	0.0010	0.0072	0.07
Xylene-o	0.0004	0.0029	0.03
Xylene-p	0.0008	0.0058	0.06
Gasoline (RVP-10) /3	0.9780	7.0606	68.62

TOTAL

70.09

TOTAL-HA PS ONLY

1.47

MAY

L_L = 12.46 SPM/T

MAY

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

MAY

L_L = see Chart

S = 666

P = 5.1744

M = 62.447

T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E³ gallons

MAY

HA Ps Compounds	Mole Fraction	L _L (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0045	0.0354	0.34
Ethylbenzene	0.0005	0.0039	0.04
Hexane	0.0071	0.0559	0.54
Naphthalene	0.0000	4.69E-06	4.56E-05
Toluene	0.0068	0.0520	0.51
Trimethylpentane (2,2,4)	0.0018	0.0142	0.14
Xylene-m	0.0012	0.0095	0.09
Xylene-o	0.0005	0.0039	0.04
Xylene-p	0.0009	0.0071	0.07
Gasoline (RVP-10) /3	0.9778	7.7030	74.87

TOTAL

76.64

TOTAL-HA PS ONLY

1.77

JUNE

L_L = 12.48 SPM/T

JUNE

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 68.5 lb/lb-mole

T = absolute temperature, 508°R

JUNE

L_L = see Chart

S = 1

P = 5.5828

M = 62.428

T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E³ gallons

JUNE

IIAPs Compounds	Mole Fraction	L _L (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0045	0.0382	0.37
Ethylbenzene	0.0005	0.0042	0.04
Hexane	0.0071	0.0603	0.59
Naphthalene	0.0000	5.06E-06	4.92E-05
Toluene	0.0068	0.0561	0.65
Trimethylpentane (2,2,4)	0.0018	0.0153	0.15
Xylene-m	0.0012	0.0102	0.10
Xylene-o	0.0005	0.0042	0.04
Xylene-p	0.0009	0.0076	0.07
Gasoline (RVP ₁₀)	0.9770	8.3008	80.68

TOTAL

82.58

TOTAL--IIAPS ONLY

1.91

JULY

L_L = 12.48 SPM/T

JULY

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 68.5 lb/lb-mole

T = absolute temperature, 508°R

JULY

L_L = see Chart

S = 1

P = 6.0283

M = 62.468

T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E³ gallons

JULY

IIAPs Compounds	Mole Fraction	L _L (lb/1000 gal)	Emissions (Ton/month)
Benzene	0.0048	0.0422	0.41
Ethylbenzene	0.0005	0.0048	0.04
Hexane	0.0073	0.0670	0.65
Naphthalene	0.0000	5.47E-06	5.32E-05
Toluene	0.0069	0.0633	0.62
Trimethylpentane (2,2,4)	0.0019	0.0174	0.17
Xylene-m	0.0013	0.0119	0.12
Xylene-o	0.0005	0.0048	0.04
Xylene-p	0.0010	0.0092	0.09
Gasoline (RVP ₁₀)	0.9682	8.8882	86.39

TOTAL

88.53

TOTAL--IIAPS ONLY

2.14

AUGUST

L₁ = 12.46 SPM/T

AUGUST

where L₁ = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

AUGUST

L₁ = see Chart

S = see Chart

P = 5.8401

M = 62.459

T = 511.1

Annual Gasoline Throughput, gallons per year, =

AUGUST

HAPs Compounds	Mole Fraction	L ₁ (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0046	0.0409	0.40
Ethylbenzene	0.0005	0.0044	0.04
Hexane	0.0072	0.0640	0.62
Naphthalene	0.0000	5.30E-06	5.15E-05
Toluene	0.0068	0.0605	0.59
Trimethylpentane (2,2,4)	0.0019	0.0169	0.16
Xylene-m	0.0012	0.0107	0.10
Xylene-o	0.0005	0.0044	0.04
Xylene-p	0.0009	0.0080	0.08
Gasoline (RVP, 10) /3	0.9764	8.6824	84.39

TOTAL

86.43

TOTAL-HAPs ONLY

2.04

SEPTEMBER

L₁ = 12.46 SPM/T

SEPTEMBER

where L₁ = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 66.5 lb/lb-mole

T = absolute temperature, 508°R

SEPTEMBER

L₁ = see Chart

S = see Chart

P = 5.3582

M = 62.437

T = 511.1

Annual Gasoline Throughput, gallons per year, =

SEPTEMBER

HAPs Compounds	Mole Fraction	L ₁ (lb/10 gal)	Emissions (Ton/month)
Benzene	0.0044	0.0359	0.35
Ethylbenzene	0.0004	0.0033	0.03
Hexane	0.0070	0.0571	0.55
Naphthalene	0.0000	4.86E-06	4.72E-05
Toluene	0.0064	0.0522	0.51
Trimethylpentane (2,2,4)	0.0017	0.0139	0.13
Xylene-m	0.0012	0.0098	0.10
Xylene-o	0.0005	0.0041	0.04
Xylene-p	0.0009	0.0073	0.07
Gasoline (RVP, 10) /3	0.9775	7.8721	77.48

TOTAL

79.27

TOTAL-HAPs ONLY

1.79

19438.3 E³ gallons19438.3 E³ gallons

OCTOBER

L_L = 12.46 SPM/T

OCTOBER

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 68.5 lb/lb-mole

T = absolute temperature, 508°R

OCTOBER

L_L = see Chart

S = 1

P = 4.788

M = 62.408

T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E³ gallons

OCTOBER

IIAPs Compounds	Mole Fraction	L _L (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0042	0.0306	0.30
Ethylbenzene	0.0004	0.0029	0.03
Hexane	0.0067	0.0488	0.47
Naphthalene	0.0000	4.34E-06	4.22E-05
Toluene	0.0060	0.0437	0.42
Trimethylpentane (2,2,4)	0.0016	0.0117	0.11
Xylene-m	0.0011	0.0080	0.08
Xylene-o	0.0004	0.0029	0.03
Xylene-p	0.0008	0.0058	0.06
Gasoline (RVP-10) 13	0.9789	7.1306	69.30

TOTAL

70.80

TOTAL-IIAPS ONLY

1.50

NOVEMBER

L_L = 12.46 SPM/T

NOVEMBER

where L_L = loading loss, lb/1000 gal

S = saturation factor, dimensionless, 1.0

P = true vapor pressure, 4.0 psia

M = molecular weight of vapor, 68.5 lb/lb-mole

T = absolute temperature, 508°R

NOVEMBER

L_L = see Chart

S = 1

P = 4.248

M = 62.377

T = 511.1

Annual Gasoline Throughput, gallons per year, =

19438.3 E³ gallons

NOVEMBER

IIAPs Compounds	Mole Fraction	L _L (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0040	0.0258	0.25
Ethylbenzene	0.0004	0.0026	0.03
Hexane	0.0064	0.0413	0.40
Naphthalene	0.0000	3.85E-06	3.74E-05
Toluene	0.0055	0.0355	0.35
Trimethylpentane (2,2,4)	0.0013	0.0084	0.08
Xylene-m	0.0010	0.0065	0.06
Xylene-o	0.0004	0.0026	0.03
Xylene-p	0.0007	0.0045	0.04
Gasoline (RVP-10) 13	0.9803	6.3323	61.54

TOTAL

62.78

TOTAL-IIAPS ONLY

1.24

DECEMBER
L_L = 12.46 SPM/T

DECEMBER
where L_L = loading loss, lb/1000 gal
S = saturation factor, dimensionless, 1.0
P = true vapor pressure, 4.0 psia
M = molecular weight of vapor, 66.5 lb/lb-mole
T = absolute temperature, 508°R

DECEMBER
L_L = see Chart
S = see Chart
P = 3.9415
M = 62.359
T = 511.1

Monthly Gasoline Throughput, (gallons per month), =

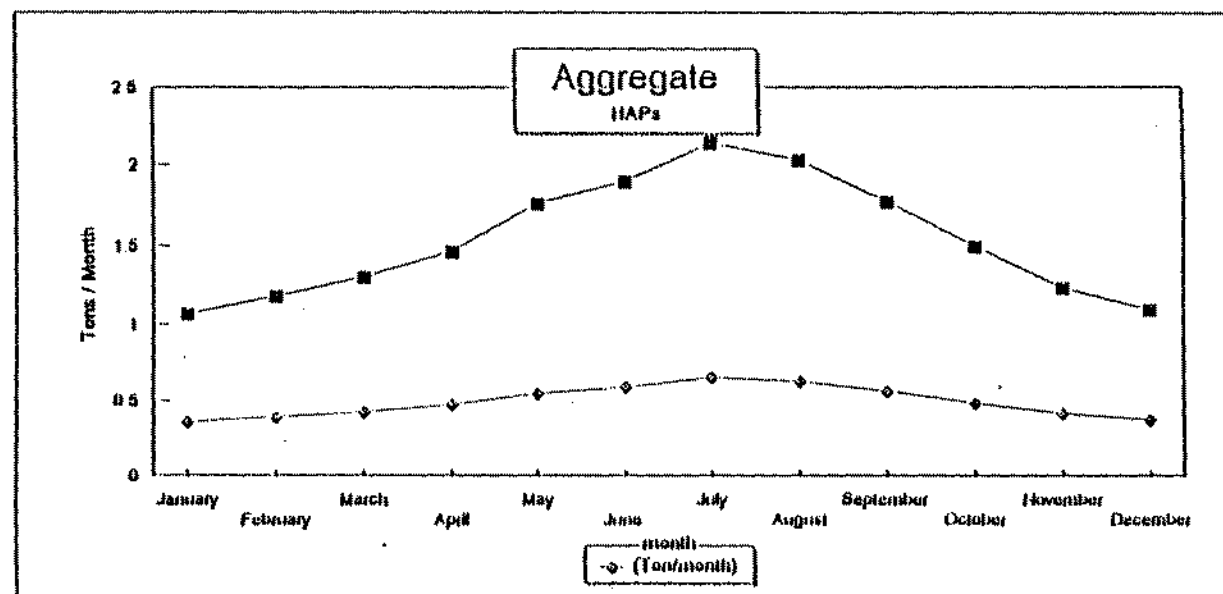
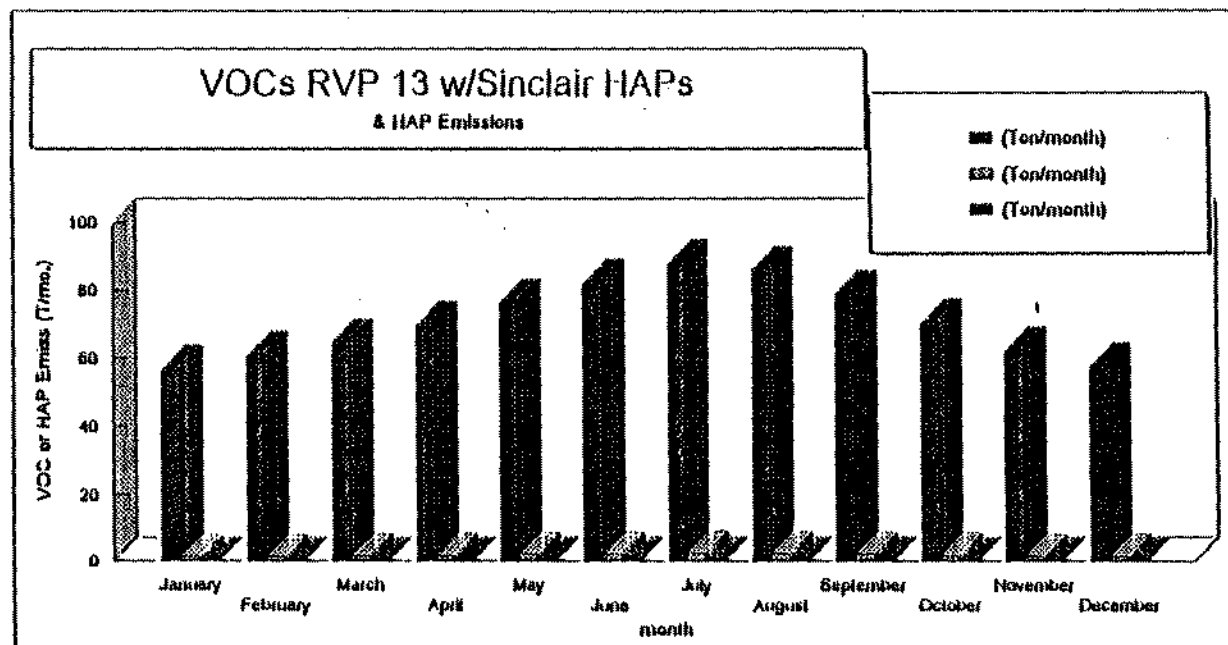
19438.3 E+3 gallons

IIAPs Compounds	Mole Fraction	L _L (lb/10 ³ gal)	Emissions (Ton/month)
Benzene	0.0038	0.0228	0.22
Ethylbenzene	0.0003	0.0018	0.02
Hexane	0.0062	0.0371	0.36
Naphthalene	0.0000	3.57E-06	3.47E-05
Toluene	0.0053	0.0318	0.31
Trimethylpentane (2,2,4)	0.0012	0.0072	0.07
Xylene-m	0.0009	0.0054	0.05
Xylene-o	0.0004	0.0024	0.02
Xylene-p	0.0007	0.0042	0.04
Gasoline (RVP-10)	0.9812	5.8791	57.14
TOTAL			58.24
TOTAL-IIAPs ONLY			1.09

ANNUAL LOADING RACK EMISSIONS (RVP 13 with Sinclair IIAPs)

VOC	Aggreg IIAP	Single IIAP	Single IIAP
Emissions (Ton/yr)	Emissions (Ton/yr)	Hexane Emis (Ton/yr)	Toluene (Ton/yr)
858.53	18.49	5.83	4.24

	Aggregate IIAPs (Ton/month)	Hexane Emissions (Ton/month)	VOC Emissions (Ton/month)
January	1.06	0.35	57.21
February	1.18	0.39	61.12
March	1.30	0.42	64.86
April	1.47	0.47	70.09
May	1.77	0.54	76.64
June	1.91	0.59	82.58
July	2.14	0.65	88.53
August	2.04	0.62	86.43
September	1.78	0.55	78.27
October	1.50	0.47	70.80
November	1.24	0.40	62.78
December	1.09	0.36	58.24



RVP 13 - SINCLAIR HAP COMPERITION.

Tank Dimensions

Diameter (ft): 60

Volume(gallons): 839400

Turnovers: 69

Paint Characteristics

Shell Condition: Light Rust

Shell Color/Shaide: White/White

Shell Paint Condition: Good

Roof Characteristics

Roof Type: Double Deck

Fitting Category: Typical

Tank Construction and Rim-Seal System

Construction: Welded

Primary Seal: Mechanical Shoe

Secondary Seal: Rim-mounted

Roof Fitting/Status	Quantity
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1
Unslotted Guide-Pole Well/Ungasketed Sliding Cover	1
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10
Roof Drain (3-in. Diameter)/Open	1
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1
Gauge-Float Well (20-in. Diam.)/Unbolted Cover, Ungask.	1
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1

TANKS PROGRAM 2.0 EMISSIONS REPORT - DETAIL FORMAT LIQUID CONTENTS OF STORAGE TANK

Mixture/Component	Month	Daily Liquid Surf. Bulk		Temperatures (deg F)		Vapor Pressures (psia)		Vapor Weight	Liquid Mass		Vapor Mass		Mol. Weight		Basis for Vapor Pressure	
		Avg.	Min.	Max.	(deg F)	Avg.	Min.	Max.	Fract.	Fract.	Fract.	Fract.	Option 1	Option 2	Option 3	Option 4
Gasoline RVP 13 with Sinclair	JAN	42.41	39.23	45.60	51.12	3.87275	N/A	N/A	N/A	62.354	0.0188	0.0038	78.11	Option 2: A=6.9050, B=1211.033, C=220.790		
Benzene						0.7021	N/A	N/A	N/A	N/A	0.0207	0.0003	106.17	Option 2: A=6.9750, B=1424.255, C=213.210		
Ethylbenzene						0.0573	N/A	N/A	N/A	N/A	0.7043	0.9814	62.00	Option 4: RVP=13.00, ASTM Slope=2.5		
Gasoline (RVP 13)						4.6370	N/A	N/A	N/A	N/A	0.0181	0.0062	86.17	Option 2: A=6.8760, B=1171.170, C=224.410		
Hexane (-n)						1.1875	N/A	N/A	N/A	N/A	0.0151	0.0011	114.22	Option 1		
Isooctane						0.2550	N/A	N/A	N/A	N/A	0.0013	0.0008	128.16	Option 2: A=7.1463, B=1831.571, C=211.821		
Naphthalene C-10, H-8						0.0010	N/A	N/A	N/A	N/A	0.0972	0.0052	92.13	Option 2: A=6.9540, B=1344.800, C=219.480		
Toluene						0.1864	N/A	N/A	N/A	N/A	0.0448	0.0009	106.17	Option 2: A=7.0090, B=1426.266, C=215.110		
Xylene (-m)						0.0690	N/A	N/A	N/A	N/A	0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690		
Xylene (-o)						0.0368	N/A	N/A	N/A	N/A	0.0448	0.0007	106.16	Option 2: A=7.0206, B=1474.403, C=217.773		
Xylene (-p) "Paraxylene"						0.0515	N/A	N/A	N/A	N/A						
Gasoline RVP 13 with Sinclair	FEB	45.64	41.69	49.59	51.12	4.13610	N/A	N/A	N/A	62.371	0.0188	0.0039	78.11	Option 2: A=6.9050, B=1211.033, C=220.790		
Benzene						0.7734	N/A	N/A	N/A	N/A	0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210		
Ethylbenzene						0.0647	N/A	N/A	N/A	N/A	0.7043	0.9806	62.00	Option 4: RVP=13.00, ASTM Slope=2.5		
Gasoline (RVP 13)						5.1633	N/A	N/A	N/A	N/A	0.0181	0.0063	86.17	Option 2: A=6.8760, B=1171.170, C=224.410		
Hexane (-n)						1.3001	N/A	N/A	N/A	N/A	0.0151	0.0013	114.22	Option 1		
Isooctane						0.3111	N/A	N/A	N/A	N/A	0.0013	0.0008	128.16	Option 2: A=7.1463, B=1831.571, C=211.821		
Naphthalene C-10, H-8						0.0012	N/A	N/A	N/A	N/A	0.0972	0.0054	92.13	Option 2: A=6.9540, B=1344.800, C=219.480		
Toluene						0.2078	N/A	N/A	N/A	N/A	0.0448	0.0009	106.17	Option 2: A=7.0090, B=1426.266, C=215.110		
Xylene (-m)						0.0777	N/A	N/A	N/A	N/A	0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690		
Xylene (-o)						0.0417	N/A	N/A	N/A	N/A	0.0448	0.0007	106.16	Option 2: A=7.0206, B=1474.403, C=217.773		
Xylene (-p) "Paraxylene"						0.0581	N/A	N/A	N/A	N/A						
Gasoline RVP 13 with Sinclair	MAR	48.57	43.26	53.89	51.12	4.38788	N/A	N/A	N/A	62.386	0.0188	0.0040	78.11	Option 2: A=6.9050, B=1211.033, C=220.790		
Benzene						0.8432	N/A	N/A	N/A	N/A	0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210		
Ethylbenzene						0.0721	N/A	N/A	N/A	N/A	0.7043	0.9799	62.00	Option 4: RVP=13.00, ASTM Slope=2.5		
Gasoline (RVP 13)						5.4749	N/A	N/A	N/A	N/A	0.0181	0.0065	86.17	Option 2: A=6.8760, B=1171.170, C=224.410		
Hexane (-n)						1.4099	N/A	N/A	N/A	N/A	0.0151	0.0014	114.22	Option 1		
Isooctane						0.3622	N/A	N/A	N/A	N/A	0.0013	0.0008	128.16	Option 2: A=7.1463, B=1831.571, C=211.821		
Naphthalene C-10, H-8						0.0014	N/A	N/A	N/A	N/A	0.0972	0.0057	92.13	Option 2: A=6.9540, B=1344.800, C=219.480		
Toluene						0.2290	N/A	N/A	N/A	N/A	0.0448	0.0010	106.17	Option 2: A=7.0090, B=1426.266, C=215.110		
Xylene (-m)						0.0865	N/A	N/A	N/A	N/A	0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690		
Xylene (-o)						0.0466	N/A	N/A	N/A	N/A	0.0448	0.0007	106.16	Option 2: A=7.0206, B=1474.403, C=217.773		
Xylene (-p) "Paraxylene"						0.0648	N/A	N/A	N/A	N/A						
Gasoline RVP 13 with Sinclair	APR	52.46	45.90	59.03	51.12	4.74073	N/A	N/A	N/A	62.405	0.0188	0.0042	78.11	Option 2: A=6.9050, B=1211.033, C=220.790		
Benzene						0.9440	N/A	N/A	N/A	N/A	0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210		
Ethylbenzene						0.0831	N/A	N/A	N/A	N/A	0.7043	0.9790	62.00	Option 4: RVP=13.00, ASTM Slope=2.5		
Gasoline (RVP 13)						5.9114	N/A	N/A	N/A	N/A	0.0181	0.0067	86.17	Option 2: A=6.8760, B=1171.170, C=224.410		
Hexane (-n)						1.5673	N/A	N/A	N/A	N/A						

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK, CONT.

Mixture/Component	Month	Daily Liquid Surf. Temp. (deg F)		Vapor Pressures (psia)		Vapor Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight Calculations		
		Temperatures (deg F)		Pressures (psia)							
		Avg.	Max.	Avg.	Min.						
Liquid Bulk											
Isocetane				0.4345	N/A	N/A	0.0151	0.0015	114.22	Option 1	
Naphthalene C-10, H-8				0.0017	N/A	N/A	0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821	
Toluene				0.2600	N/A	N/A	0.0972	0.0059	92.13	Option 2: A=6.9540, B=1344.800, C=219.480	
Xylene (-m)				0.0995	N/A	N/A	0.0448	0.0010	106.17	Option 2: A=7.0090, B=1426.266, C=215.110	
Xylene (-o)				0.0539	N/A	N/A	0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690	
Xylene (-p) "Paraxylene"				0.0746	N/A	N/A	0.0448	0.0008	106.16	Option 2: A=7.0206, B=1474.403, C=217.773	
Gasoline RVP 13 with Sinclair											
Gasoline RVP 13 with Sinclair	MAY	56.94	49.41	64.47	51.12	5.1744	N/A	62.428			
Benzene				1.0722	N/A	N/A	0.0188	0.0043	78.11	Option 2: A=6.9050, B=1211.033, C=220.790	
Ethylbenzene				0.0975	N/A	N/A	0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210	
Gasoline (RVP 13)				6.4476	N/A	N/A	0.7043	0.9779	62.00	Option 4: RVP=13.00, ASTM Slope=2.5	
Hexane (-n)				1.7660	N/A	N/A	0.0181	0.0069	86.17	Option 2: A=6.8760, B=1171.170, C=224.410	
Isocetane				0.5209	N/A	N/A	0.0151	0.0017	114.22	Option 1	
Naphthalene C-10, H-8				0.0021	N/A	N/A	0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821	
Toluene				0.2999	N/A	N/A	0.0972	0.0063	92.13	Option 2: A=6.9540, B=1344.800, C=219.480	
Xylene (-m)				0.1165	N/A	N/A	0.0448	0.0011	106.17	Option 2: A=7.0090, B=1426.266, C=215.110	
Xylene (-o)				0.0636	N/A	N/A	0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690	
Xylene (-p) "Paraxylene"				0.0874	N/A	N/A	0.0448	0.0008	106.16	Option 2: A=7.0206, B=1474.403, C=217.773	
Gasoline RVP 13 with Sinclair											
Gasoline RVP 13 with Sinclair	JUN	60.89	52.92	68.86	51.12	5.5828	N/A	62.447			
Benzene				1.1969	N/A	N/A	0.0188	0.0045	78.11	Option 2: A=6.9050, B=1211.033, C=220.790	
Ethylbenzene				0.1119	N/A	N/A	0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210	
Gasoline (RVP 13)				6.9519	N/A	N/A	0.7043	0.9770	62.00	Option 4: RVP=13.00, ASTM Slope=2.5	
Hexane (-n)				1.9580	N/A	N/A	0.0181	0.0071	86.17	Option 2: A=6.8760, B=1171.170, C=224.410	
Isocetane				0.6006	N/A	N/A	0.0151	0.0018	114.22	Option 1	
Naphthalene C-10, H-8				0.0025	N/A	N/A	0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821	
Toluene				0.3394	N/A	N/A	0.0972	0.0066	92.13	Option 2: A=6.9540, B=1344.800, C=219.480	
Xylene (-m)				0.1334	N/A	N/A	0.0448	0.0012	106.17	Option 2: A=7.0090, B=1426.266, C=215.110	
Xylene (-o)				0.0736	N/A	N/A	0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690	
Xylene (-p) "Paraxylene"				0.1003	N/A	N/A	0.0448	0.0009	106.16	Option 2: A=7.0206, B=1474.403, C=217.773	
Gasoline RVP 13 with Sinclair											
Gasoline RVP 13 with Sinclair	JUL	64.94	56.05	73.82	51.12	6.0283	N/A	62.468			
Benzene				1.3371	N/A	N/A	0.0188	0.0046	78.11	Option 2: A=6.9050, B=1211.033, C=220.790	
Ethylbenzene				0.1286	N/A	N/A	0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210	
Gasoline (RVP 13)				7.5016	N/A	N/A	0.7043	0.9760	62.00	Option 4: RVP=13.00, ASTM Slope=2.5	
Hexane (-n)				2.1725	N/A	N/A	0.0181	0.0073	86.17	Option 2: A=6.8760, B=1171.170, C=224.410	
Isocetane				0.6945	N/A	N/A	0.0151	0.0019	114.22	Option 1	
Naphthalene C-10, H-8				0.0030	N/A	N/A	0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821	
Toluene				0.3843	N/A	N/A	0.0972	0.0069	92.13	Option 2: A=6.9540, B=1344.800, C=219.480	
Xylene (-m)				0.1530	N/A	N/A	0.0448	0.0013	106.17	Option 2: A=7.0090, B=1426.266, C=215.110	
Xylene (-o)				0.0847	N/A	N/A	0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690	
Xylene (-p) "Paraxylene"				0.1152	N/A	N/A	0.0448	0.0010	106.16	Option 2: A=7.0206, B=1474.403, C=217.773	

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK, CONT.

01/18/96
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Mixture/Component	Month	Daily Liquid Surf. Temperatures (deg F)			Liquid Bulk Temp. (deg F)		Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight		Basis for Vapor Pressure Calculations
		Avg.	Min.	Max.			Avg.	Min.	Max.						
Gasoline RVP 13 with Sinclair	AUG	63.26	55.14	71.38	51.12	51.12	5.8401	N/A	N/A	62.459					
Benzene							1.2774	N/A	N/A		0.0188	0.0046	78.11	Option 2: A=6.9050, B=1211.033, C=220.790	
Ethylbenzene							0.1215	N/A	N/A		0.0207	0.0005	106.17	Option 2: A=6.9750, B=1424.255, C=213.210	
Gasoline (RVP 13)							7.2695	N/A	N/A		0.7043	0.9764	62.00	Option 4: RVP=13.00, ASTM slope=2.5	
Hexane (-n)							2.0813	N/A	N/A		0.0181	0.0072	86.17	Option 2: A=6.8760, B=1171.170, C=224.410	
Isooctane							0.6555	N/A	N/A		0.0151	0.0019	114.22	Option 1	
Naphthalene C-10, H-8							0.0028	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821	
Toluene							0.3651	N/A	N/A		0.0972	0.0068	92.13	Option 2: A=6.9540, B=1344.800, C=219.480	
Xylene (-m)							0.1446	N/A	N/A		0.0448	0.0012	106.17	Option 2: A=7.0090, B=1426.266, C=215.110	
Xylene (-o)							0.0798	N/A	N/A		0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690	
Xylene (-p) "Paraxylene"							0.1088	N/A	N/A		0.0448	0.0009	106.16	Option 2: A=7.0206, B=1474.403, C=217.773	
Gasoline RVP 13 with Sinclair	SEP	58.75	51.48	66.02	51.12	51.12	5.3582	N/A	N/A	62.437					
Benzene							1.1278	N/A	N/A		0.0188	0.0044	78.11	Option 2: A=6.9050, B=1211.033, C=220.790	
Ethylbenzene							0.1039	N/A	N/A		0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210	
Gasoline (RVP 13)							6.6746	N/A	N/A		0.7043	0.9775	62.00	Option 4: RVP=13.00, ASTM slope=2.5	
Hexane (-n)							1.8518	N/A	N/A		0.0181	0.0070	86.17	Option 2: A=6.8760, B=1171.170, C=224.410	
Isooctane							0.5558	N/A	N/A		0.0151	0.0017	114.22	Option 1	
Naphthalene C-10, H-8							0.0023	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821	
Toluene							0.3175	N/A	N/A		0.0972	0.0064	92.13	Option 2: A=6.9540, B=1344.800, C=219.480	
Xylene (-m)							0.1240	N/A	N/A		0.0448	0.0012	106.17	Option 2: A=7.0090, B=1426.266, C=215.110	
Xylene (-o)							0.0679	N/A	N/A		0.0349	0.0005	106.17	Option 2: A=6.9980, B=1474.679, C=213.690	
Xylene (-p) "Paraxylene"							0.0931	N/A	N/A		0.0448	0.0009	106.16	Option 2: A=7.0206, B=1474.403, C=217.773	
Gasoline RVP 13 with Sinclair	OCT	52.97	47.03	58.91	51.12	51.12	4.7880	N/A	N/A	62.408					
Benzene							0.9578	N/A	N/A		0.0188	0.0042	78.11	Option 2: A=6.9050, B=1211.033, C=220.790	
Ethylbenzene							0.0846	N/A	N/A		0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210	
Gasoline (RVP 13)							5.9700	N/A	N/A		0.7043	0.9789	62.00	Option 4: RVP=13.00, ASTM slope=2.5	
Hexane (-n)							1.5887	N/A	N/A		0.0181	0.0067	86.17	Option 2: A=6.8760, B=1171.170, C=224.410	
Isooctane							0.4443	N/A	N/A		0.0151	0.0016	114.22	Option 1	
Naphthalene C-10, H-8							0.0017	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821	
Toluene							0.2642	N/A	N/A		0.0972	0.0060	92.13	Option 2: A=6.9540, B=1344.800, C=219.480	
Xylene (-m)							0.1013	N/A	N/A		0.0448	0.0011	106.17	Option 2: A=7.0090, B=1426.266, C=215.110	
Xylene (-o)							0.0550	N/A	N/A		0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690	
Xylene (-p) "Paraxylene"							0.0759	N/A	N/A		0.0448	0.0008	106.16	Option 2: A=7.0206, B=1474.403, C=217.773	
Gasoline RVP 13 with Sinclair	NOV	46.96	42.88	51.04	51.12	51.12	4.2480	N/A	N/A	62.377					
Benzene							0.8042	N/A	N/A		0.0188	0.0040	78.11	Option 2: A=6.9050, B=1211.033, C=220.790	
Ethylbenzene							0.0679	N/A	N/A		0.0207	0.0004	106.17	Option 2: A=6.9750, B=1424.255, C=213.210	
Gasoline (RVP 13)							5.3018	N/A	N/A		0.7043	0.9803	62.00	Option 4: RVP=13.00, ASTM slope=2.5	
Hexane (-n)							1.3486	N/A	N/A		0.0181	0.0064	86.17	Option 2: A=6.8760, B=1171.170, C=224.410	

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
LIQUID CONTENTS OF STORAGE TANK, CONT.

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Mixture/Component	Month	Daily Liquid Surf. Bulk			Liquid Bulk Temp. (deg F)	Vapor Pressures (psia)			Vapor Mol. Weight	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
		Temperatures (deg F)				Vapor Pressures (psia)							
		Avg.	Min.	Max.		Avg.	Min.	Max.					
Isooctane					51.12	0.3341	N/A	N/A		0.0151	0.0013	114.22	Option 1
Naphthalene C-10, H-8						0.0013	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.2171	N/A	N/A		0.0972	0.0055	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0816	N/A	N/A		0.0448	0.0010	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0438	N/A	N/A		0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0610	N/A	N/A		0.0448	0.0007	106.16	Option 2: A=7.0206, B=1474.403, C=217.773
Gasoline KVP 13 with Sinclair	DEC	43.27	40.11	46.44	51.12	8.9413	N/A	N/A	62.359				
Benzene						0.7208	N/A	N/A		0.0188	0.0038	78.11	Option 2: A=6.9050, B=1211.033, C=220.790
Ethylbenzene						0.0591	N/A	N/A		0.0207	0.0003	106.17	Option 2: A=6.9750, B=1424.255, C=213.210
Gasoline (KVP 13)						4.9223	N/A	N/A		0.7043	0.9812	62.00	Option 4: KVP=13.00, ASTM Slope=2.5
Hexane (-n)						1.2167	N/A	N/A		0.0181	0.0062	86.17	Option 2: A=6.8760, B=1171.170, C=224.410
Isooctane						0.2699	N/A	N/A		0.0151	0.0012	114.22	Option 1
Naphthalene C-10, H-8						0.0011	N/A	N/A		0.0013	0.0000	128.16	Option 2: A=7.1463, B=1831.571, C=211.821
Toluene						0.1919	N/A	N/A		0.0972	0.0053	92.13	Option 2: A=6.9540, B=1344.800, C=219.480
Xylene (-m)						0.0712	N/A	N/A		0.0448	0.0009	106.17	Option 2: A=7.0090, B=1426.266, C=215.110
Xylene (-o)						0.0380	N/A	N/A		0.0349	0.0004	106.17	Option 2: A=6.9980, B=1474.679, C=213.690
Xylene (-p) "Paraxylene"						0.0532	N/A	N/A		0.0448	0.0007	106.16	Option 2: A=7.0206, B=1474.403, C=217.773

TANKS PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
DETAIL CALCULATIONS (AP-42)

01/10/96
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Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	38.0587	46.2615	55.1481	60.5505	64.0764	66.8004	68.8375	64.4855	57.7789	50.8708	44.5675	39.33
Seal Factor (lb-mole/ft yr (mph) ⁿ):	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.2000	0.20
Average Wind Speed (mph):	8.0	9.0	10.0	10.0	9.5	9.0	8.4	8.2	8.2	8.3	8.4	8
Seal-related Wind Speed Exponent:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.
Value of Vapor Pressure Function:	0.0763	0.0824	0.0884	0.0970	0.1080	0.1189	0.1312	0.1259	0.1129	0.0982	0.0851	0.07
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	3.872699	4.136069	4.387805	4.740655	5.174414	5.582791	6.028335	5.840124	5.358184	4.788045	4.247987	3.9414
Tank Diameter (ft):	60	60	60	60	60	60	60	60	60	60	60	60
Vapor Molecular Weight (lb/lb-mole):	62.354010	62.370754	62.385600	62.405315	62.427701	62.447303	62.468029	62.459484	62.436579	62.407870	62.377482	62.3585
Product factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.00
Withdrawal Losses (lb):	14.6710	14.6710	14.6710	14.6710	14.6710	14.6710	14.6710	14.6710	14.6710	14.6710	14.6710	14.67
Net Throughput (gal/month):	4854530	4854530	4854530	4854530	4854530	4854530	4854530	4854530	4854530	4854530	4854530	48545
Shell Clingage Factor (lb/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.00
Average Organic Liquid Density (lb/gal):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
Tank Diameter (ft):	60	60	60	60	60	60	60	60	60	60	60	60
Roof Fitting Losses (lb):	280.0168	342.3668	410.4566	450.6660	475.5676	494.3683	507.6690	475.0137	425.6117	374.9456	328.6802	289.594
Value of Vapor Pressure Function:	0.0763	0.0824	0.0884	0.0970	0.1080	0.1189	0.1312	0.1259	0.1129	0.0982	0.0851	0.077
Vapor Molecular Weight (lb/lb-mole):	62.354010	62.370754	62.385600	62.405315	62.427701	62.447303	62.468029	62.459484	62.436579	62.407870	62.377482	62.35851
Product factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000
Tot. Roof Fitting Loss Fact. (lb-mole/yr):	706.3198	799.2734	893.1371	893.1371	846.0948	799.2734	743.3885	724.8350	724.8350	734.1070	743.3885	715.572
Average Wind Speed (mph):	8.0	9.0	10.0	10.0	9.5	9.0	8.4	8.2	8.2	8.3	8.4	8.
Roof Fitting Loss Factors												
Roof Fitting/Status	Quantity		Kfa (lb-mole/yr)		Kfb (lb-mole/(yr mph ⁿ))		m					
Vacuum Breaker (10-in. Diam. Well)/Weighted Mech. Actuation, Gask.	1		1.20		0.17		1.00					
Unbolted Guide-Pole Well/Unlashed Sliding Cover	1		0.00		67.00		0.98					
Roof Leg (3-in. Diameter)/Adjustable, Double-Deck Roofs	10		0.25		0.07		1.00					
Roof Drain (3-in. Diameter)/Open	1		0.00		7.00		1.40					
Rim Vent (6-in. Diameter)/Weighted Mech. Actuation, Gask.	1		0.71		0.10		1.00					
Gauge-Hatch/Sample Well (8-in. Diam.)/Weighted Mech. Actuation, Gask	1		0.95		0.14		1.00					
Gauge-Flout Well (20-in. Diam.)/Unbolted Cover, Unlashed	1		2.30		5.90		1.00					
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1		0.00		0.00		0.00					
Total Losses (lb):	332.75	403.30	480.28	525.89	554.32	575.84	591.18	554.17	498.06	440.49	387.92	343.61

TANKER PROGRAM 2.0
EMISSIONS REPORT - DETAIL FORMAT
INDIVIDUAL TANK EMISSION TOTALS

01/18/90
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Months in Report: January, February, March, April,
May, June, July, August,
September, October, November, December

Liquid Contents	Losses (lbs.):			Total Standing	Total
	Total Withdrawal	Roof-Fitting	Rim-Seal		
Gasoline RVP 13 with Sinclair	176.05	4854.96	656.77	5511.73	5687.78
Benzene	3.31	20.62	2.79	23.41	26.72
Ethylbenzene	3.64	2.03	0.28	2.31	5.95
Gasoline (RVP 13)	124.00	4750.74	642.67	5393.41	5517.41
Hexane (-n)	3.19	32.83	4.44	37.27	40.45
Isooctane	2.66	7.69	1.04	6.73	11.39
Naphthalene C-10, H-8	0.23	0.00	0.00	0.00	0.23
Toluene	17.11	29.60	4.00	33.61	50.72
Xylene (-m)	7.89	5.27	0.71	5.98	13.86
Xylene (-o)	6.14	2.23	0.30	2.54	8.68
Xylene (-p) "Paraxylene"	7.89	3.95	0.53	4.48	12.37
Total:	176.05	4854.96	656.77	5511.73	5687.78

ATTACHMENT E

EPA AP-42 "Interim" Process Fugitive VOC Emission Factors

NEW EQUIPMENT LEAK EMISSION FACTORS
FOR
OIL & GAS PRODUCTION OPERATIONS

August 1995

The U.S. Environmental Protection Agency (EPA) evaluated data on equipment leak emissions from the oil and gas production operations gathered by the American Petroleum Institute. Based on the analysis of the data, EPA is providing interim average emission factors from leaking equipment at oil and gas production facilities. These interim measures are acceptable to EPA from a technical standpoint for immediate use to estimate emissions from leaking equipment.

Since State/local programs may experience some transition time to accommodate new factors, the EPA suggests that any contemplated use of these factors in the near term for submitting information for trading, offsets or netting, 15% plans, or modelled attainment demonstrations, and regulations associated with these programs, be coordinated with the State in which the source is located.

If you have any questions please call David Markwordt at (919) 541-0837 (FAX 0942).

Average Emission Factors for Oil and Gas Production Operations
(kg/hr/component)
(sample size is indicated in parentheses)

Equipment Type ^a	Equipment Type/Service			
	Gas	Heavy Oil ($<20^\circ\text{API Gravity}$)	Light Oil ($\geq 20^\circ\text{API Gravity}$)	Water/Light Oil ^b
Connector	2.0E-04 (36.622)	7.5E-06 (7.338)	2.1E-04 (74.634)	1.1E-04 (2.451)
Flange	3.9E-04 (11.356)	3.9E-07 (3.215)	1.1E-04 (23.581)	2.3E-06 (677)
Open-Ended Line	2.0E-03 (1.030)	1.4E-04 (439)	1.4E-03 (2.578)	2.5E-04 (123)
Other ^b	8.3E-03 (536)	3.1E-05 (194)	7.5E-03 (954)	1.4E-02 (92)
Pump	2.4E-03 (71)	NA	1.3E-02 (162)	2.4E-05 (17)
Valve	4.5E-03 (11.752)	8.4E-06 (2.073)	2.5E-03 (23.723)	9.3E-05 (724)

^aWater/Light Oil emission factors apply to water streams in light oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.

^bThe "other" equipment type includes compressors, diaphragms, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents.

NEW EQUIPMENT LEAK EMISSION FACTORS
FOR
PETROLEUM REFINERIES, GASOLINE MARKETING , AND
OIL & GAS PRODUCTION OPERATIONS

February 1995

The U.S. Environmental Protection Agency (EPA) evaluated data on equipment leak emissions from the petroleum refining, gasoline marketing, and oil and gas production operations gathered by the American Petroleum Institute and the Western States Petroleum Association. Based on the analysis of the data and incorporation of comments from industry and state and local air pollution control associations, EPA is providing interim emission correlations to estimate emissions from leaking equipment at refineries, gasoline marketing facilities, and oil and gas production facilities. Additionally, average emission factors for marketing terminals are provided. These interim measures may change based on additional input from state and local air pollution control agencies and industry, but are acceptable to EPA from a technical standpoint for immediate use to estimate emissions from leaking equipment.

Since State/local programs may experience some transition time to accommodate new factors, the EPA suggests that any contemplated use of these factors in the near term for submitting information for trading, offsets or netting, 15% plans, or modelled attainment demonstrations, and regulations associated with these programs, be coordinated with the State in which the source is located.

The new equipment leak emission correlations require plant specific data to use in conjunction with the equations provided below. For situations where plant data is not available, estimates must use the existing average factors for leaking equipment from the document "Protocol for Equipment Leak Emission Estimates," EPA-453/R-93-026, June 1993 or the marketing factors provided here. The methodology and supporting appendices used to develop the factors presented below are available on the OAQPS TTN bulletin board (see files: leaks.meth, leaks.A, leaks.B, and leaks.C under Chief/AP42/Q&A). If you have any questions please call David Markwordt at (919) 541-0837 (FAX 0942).

Marketing Terminal Emissions Factors

(based on 17 Marketing Terminals, rec. October 1994, calc. January 1995)

Equipment Type	Equipment Service	Sample Size	Average Emission Factor (kg/hr)	Avg Emission Factor (lb/hr/source)
Fitting (connectors and flanges) ^a	Gas	1,894	4.1E-05	9.0E-5
	Light Liquid	42,172	7.8E-06	1.7E-5
Other (compressors and others)	Gas	153	1.3E-04	2.6E-4
	Light Liquid	2,258	1.3E-04	2.9E-4
Pump	Light Liquid	777	5.3E-04	1.2E-3
Valve	Gas	873	1.3E-05	2.9E-5
	Light Liquid	27,989	4.3E-05	9.5E-5

^a "Fittings" were not identified as flanges or connectors; therefore, the fitting emissions were estimated by averaging the estimates from the connector and the flange equations.

CONVERSION :
2.2046 lb/kg